MATERNAL AND PERINATAL OUTCOME OF 4000 CONSECUTIVE CASES OF CAESAREAN SECTION

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BONAFIDE CERTIFICATE

This is to certify that the study entitled "MATERNAL AND PERINATAL OUTCOME OF CONSECUTIVE 4000 CASES OF CAESAREAN SECTION" is a bonafide work done by Dr.S.Prasanna Lakshmi at Institute of Obstetrics and Gynaecology during the period of Post Graduate study in Obstetrics and Gynaecology from May 2004 – March 2007 under the guidance of Retd. Director & Superintendent Institute of Obsetetrics & Gynaecology - Prof. Dr. V.Madhini, M.D., D.G.O., M.N.A.M.S. and Prof. Dr. Latha Jawahar, M.D.,D.G.O Institute of Obstetrics and Gynaecology. This dissertation is submitted to Tamilnadu Dr.M.G.R Medical University in partial fulfillment of University rules and regulations for the award of M.D. Degree in Obstetrics and Gynaecology.

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Introduction

For most individuals the choice to live a healthy life – free from illness and ailments and a reasonable life span, are crucial attributes in the notion of personal well-being. Similarly, for a society a transition from high incidence of morbidity and mortality, to a state where people generally enjoy long and disease free lives is considered a desirable and valued social change. It is only natural, then, that indicators on health and longevity, as well as indicators that variously capture demographic concerns of a society are important constituents in the framework for evaluating the development process under the human development approach.

A healthy mother taking home a healthy child at the end of her pregnancy is the aim of every obstetrician. This ideal conclusion to gestation, though aspired for, may not be achieved in all cases. Non-viable or lethal congenital anomalies of fetus, unexplained premature labour, antepartum separation of placenta, uncontrolled toxaemias etc invariably lead to loss of fetus. There is a definite group of fetal loss which can be termed as avoidable causes of perinatal mortality.

Gross maternal malnutrition inadequate or poor knowledge of pregnancy, undetected early toxaemia and diabetes in pregnancy, failure to detect feto-pelvic disproportions, malpresentations, adventurous use of instrumentation like forceps by untrained personal, inordinate delay in detecting fetal distress, a lapse in the constant monitoring of evolving labour etc. constitute this group of perinatal loss which is a reflection of the ignorance or indifference on the part of health delivery system in rendering the desired level of antenatal care and advice, or on the part of the obstetrician who looks after the confinement.

What ever may be the cause, the result is an avoidable fetal loss which in itself causes potential emotional trauma to the mother with possible psychological repercussions later on. The loss of fetus or neonate in normal vaginal delivery is bad enough by itself, but the predicament is compounded if the perinatal loss were to occur after a caesarean section delivery. Added to the physical, trauma and morbidity associated with any laparotomy this automatically puts the mother in a high risk category in her future pregnancies.

Caesarean section rates have been increasing worldwide, raising the question of

appropriateness of the selection of causes for the procedure. This cannot be attributed entirely to the rise in institutional deliveries alone because of the strong association between caesarean sections and private sector institutions.

Surgical interventions during pregnancy are usually performed to ensure safety of the mother and child under conditions of obstetric risk. They are justified under certain circumstances such as CPD and contracted Pelvis, dystocia due to soft parts, inadequate uterine forces, antepartum Haemorrhage, preeclamptic toxaemia, eclampsia, fetal distress and cord prolapse, malpresentation, maternal diseases such as heart problems, bad obstetric history, habitual intra-uterine death of the fetus and elderly primigravida (cunningham etal.1989)

C-section deliveries have other serious implications for the health of the women undergoing them. The uterine scar thus caused may prove to be weaker in successive pregnancies resulting in increased maternal morbidity (Mudaliar and Menon 1978). In case of elective caesarean section, if not properly timed (before the onset of spontaneous labour), neonatal problems like iatrogenic prematurity and respiratory distress syndrome due to pulmonary immaturity may ensue.(Bowers et al. 1982)

c – section rates have been increasing in the developing countries with increasing institutional deliveries and growing access to gynecological and obstetric care.

Historical Background

The history of caesarean section continues to challenge historians and facinate obstetricians. The term caesarean is most likely to be derived from the latin verb 'Caedare' meaning 'to cut or to kill', the children of such births were referred to as 'caesans'. The term 'section' has its origin from latin verb 'secare' 'To cut or its noun 'section'. Caesarean section is a tautology : both words connote 'incision'.

The word is rumored to have originated for Julius Caesar. Who it is believed to be the first infant born by this method in 100B.C. This is very doubtful, especially in light of the fact that his mother Aurelia survived his birth.

Until early this century the procedure was usually performed without any anesthetic whatsoever. The maternal mortality was hundred per cent. The oldest authentic record of a caesarean survivor is however that of Gorgias, the orator of sicily in 508 B.C. and another early caesarean surviver was Scipio Africanus born in 237 B.C.

It was the Jesiut, Theophile Raynaud, who first used the term caesareans in the title of his book, which was the first to be written on the caesarean operation. In 716 A.D, Numa Pompelius first imposed "The Law of the caesans" Lex regia or Lax caesarean – This edict concerned the abdominal delivery of a child during a life – saving attempt in the unusual circumstances of dying or recently dead mother (Good Samaritan Law).

The oldest record of a caesarean operation dates to the sumerians in the second millenium B.C., In 1500 A.D. Jacob Nuffer, the sow-gelder who supposedly performed a successful procedure on his own wife following several days of labour.

In 17th century caesarean delivery was successfully performed on living women.

The introduction of suture material, which enabled the surgeon to control bleeding, was of monumental importance in the evolution of the procedure. In 1882, Max Sanger from Leipzig published a monograph based largely on experienced from surgeons in United states who had used internal sutures, explaining the principles and techniques of caesarean delivery, including aseptic preparation, with special emphasis on a two step uterine closure using silver wire and silk and careful attention to haemostasis.

Fosiander of Geottingen (1759 – 1822) and Munroker and J. Boliver Delec (1869-1942) advocated the low transverse operation which rapidly replaced the classical procedure due to reduced risk of serious infection and uterine rupture in subsequent labour.

In 1911, Opitz described the vertical lower segment caesarean section with serosal closure. In 1912, B. Kronig later modified to include raising the bladder serosa to cover the uterine incision. In modern days many surgeons have not advocated this technique to reduce adhesions formation.

In recent years, with the advent of antibiotics, transfusion facilities and safe anaesthesia with consequent reduction in maternal mortality, the operation which was primarily done for dystocia was soon extended to include fetal distress and other indications in order to reduce perinatal mortality. With the availability of intrapartum electronic fetal monitoring and marked improvement in neonatal care, there was further rise in the rate of caesarean section for fetal indication to prevent potentially grave neonatal morbidity.

As the risk versus – benefits consideration changed, obstetricians became more confident in the use of caesarean section and began to argue against delaying surgery. Surgeons such as Robert Hams of the United States and Thomas Radford of England and Franz Von Winckel of Germany recommend caesarean delivery as an early solution to labour disorders to improve outcome.

As the figures of maternal mortality after caesarean section plummeted, the procedure became more accepted and established.

Review

Of

Literature

Caesarean sections are among the most commonly performed surgical procedures, but there have been concerns that they are performed excessively. Caesarean delivery rate are highly controversial and wide variations are noted in developed to developing countries, rural to urban and teaching to non-teaching hospitals.

International Caesarean Section rate

USA – 25%

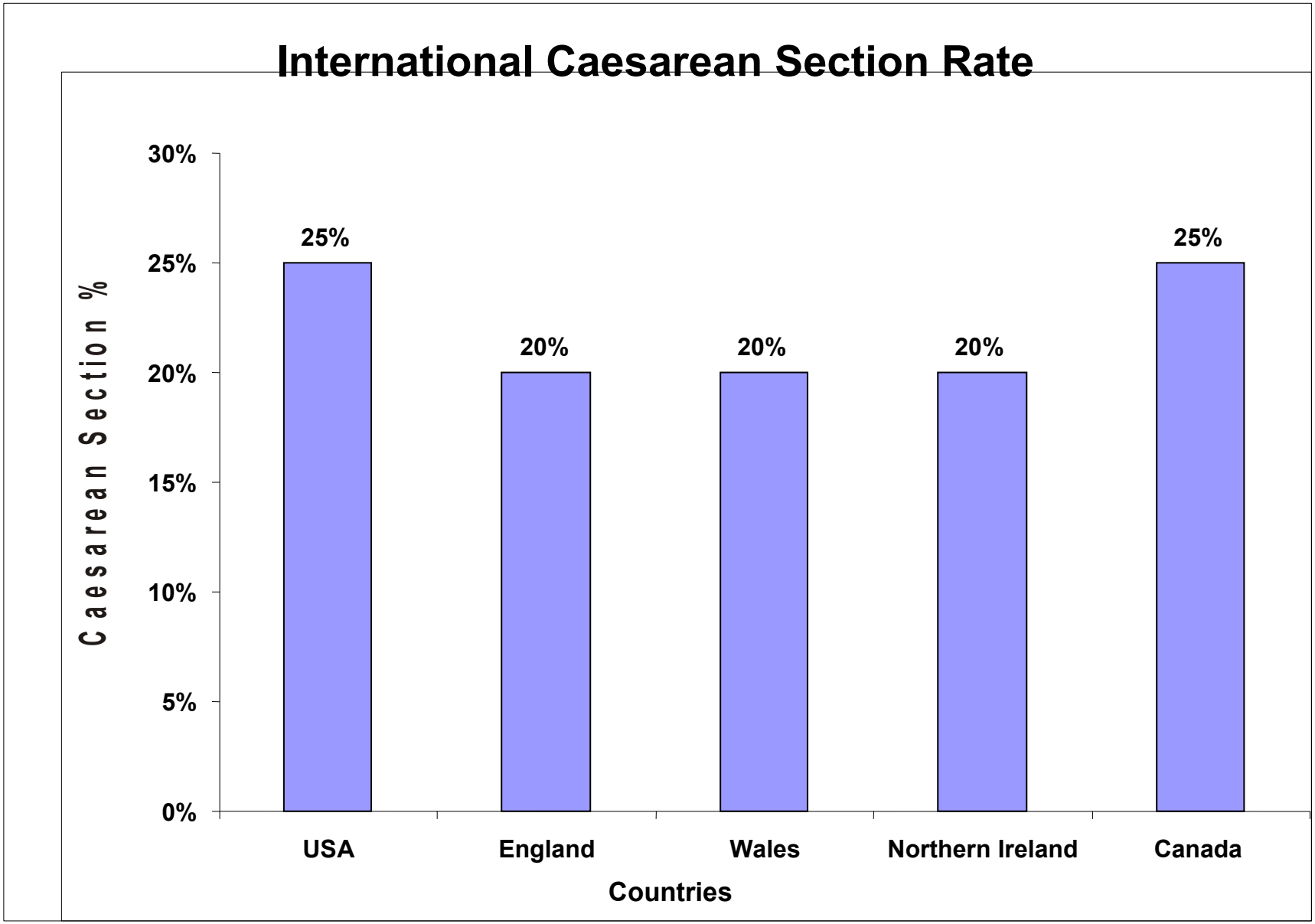
England – 20%

Wales – 20%

NetherIreland – 20%

Canada – 25%

(September 2004 BMJ)

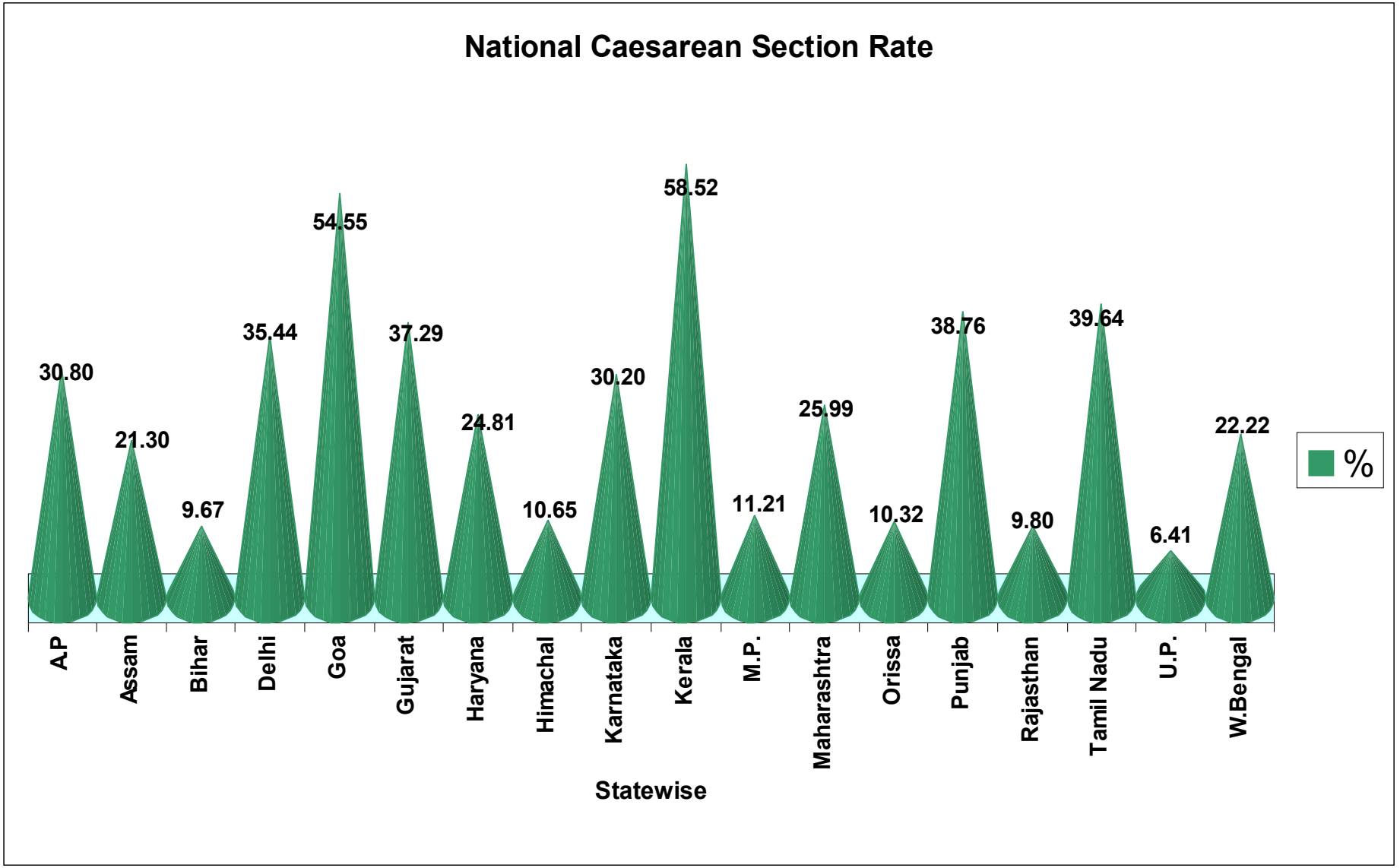

International Caesarean Section Rate
Caesarean Section %
30%
25%
20%
15%
10%
5%
0%
25%
20%
20%
20%
25%
USA
England
Wales
Northern Ireland
Canada
Countries

National caesarean section rates :

Andhra Pradesh	30.80%
Assam	21.30%
Bihar	9.67%
Delhi	35.44%
Goa	54.55%
Gujarat	37.29%
Haryana	24.81%
Himachal Pradesh	10.65%
Karnataka	30.20%
Kerala	58.52%
Madhya Pradesh	11.21%
Maharashtra	25.99%
Orissa	10.32%
Punjab	38.76%
Rajasthan	9.80%
Tamil Nadu	39.64%
Uttar Pradesh	6.41%
West Bengal	22.22%

Data from National Family Health Survey, India, 1992-93

(Mishra US, Ramanathan M, Healthy Policy Plan 2002 (Mar; 17(1) : 90-8)


National Caesarean Section Rate
30.80
21.30
9.67
35.44
54.55
37.29
24.81
10.65
30.20
58.52
11.21
25.99
10.32
38.76
9.80
39.64
6.41
22.22
%
A.P
Assam
Bihar
Delhi
Goa
Gujarat
Haryana
Himachal
Karnataka
Kerala
M.P.
Maharashtra
Orissa
Punjab
Rajasthan
Tamil Nadu
U.P.
W.Bengal
Statewise

A critical appraisal of caesarean section rates at teaching hospitals in India by Kambo I et al 2002 showed that the overall caesarean section rates increased from 21.8% in 1993-1994 to 25.4% in 1998-1999.

The lack of evidence on risks and benefits of caesarean section versus vaginal delivery, making informed decisions with individual patients is difficult. This lack of evidence and risks and benefits, combined with the changing preferences of patients and roles for doctors, makes setting National goals for rates of caesarean sections virtually impossible.

A study by Pai M et al Indian Medical Journal (1999) showed the caesarean section rate in Chennai to be 45%.

The probable reasons for the increasing rate are :

a. Medical advances diminishing maternal risks

b. Labour and delivery related failures

- Repeat caesarean birth
- Continuous electronic fetal monitoring
- Epidural analgesia / anaesthesia
- Macrosomia (>4000 vs >4500g)
- Decreased operative deliveries

c. Maternal factors

- More older child bearing women / delay in child birth
- More nulliparous women with attendant risk.

- Increasing maternal risk
- Active genital Herpes

d. Fetal factors

- fetus as a patient
- Breech presentation
- VLBW fetus
- Post term pregnancy
- Multiple gestation
- Failed induction for fetal indication

e. Physician factors

- fear of malpractice litigation
- physician compensation (possible)
- Physician convenience (possible)

(Data from Taffel et al., Notzon et al, plack et al),

1. High number of **repeat sections** as many obstetricians are reluctant to take any risks in allowing subsequent trial of vaginal delivery
2. Increasing number of cases of fetal distress detected by **continuous electronic fetal monitoring**.

The fetus being viewed as a person and eventually a patient.

3. There is **reduced parity** and small family norm hence obstetrician tend to decide earlier on a caesarean section.

4. The average age of women at birth increased. There is dramatic increase in the pregnancy of pregnancies after the ages of 30-35.

5. A steep increase in caesarean rates for Breech presentation especially in primigravida (Green JE et al)

6. The incidence of midpelvic operative vaginal deliveries has

decreased. The obstetricians preference for a caesarean section than for a difficult vaginal delivery such as a difficult midforceps and internal podalic version.

7. Widely held belief that increased caesarean rates will result in decreased perinatal mortality.

8. The survival rates in low birth weight and very low birth weight babies are better by caesarean section than by vaginal delivery as it prevents intracranial trauma.

9. Increasing incidence of planned induction of labour and resorting to caesarean section when induction fails.

10. Antepartum haemorrhage – Caesarean section is considered the operation of choice for placenta praevia, and gives better fetal prognosis in accidental haemortage.

11. Rising incidence of I.U.G.R.

12. To avoid malpractice litigation for alleged neglect in delivery when there is cerebral palsy or convulsions in the child later. (Feldman et al, M Eng J Med 312:1264)

13. Lack of patience , on part of the patient or her physician.

14. Early liberalisation of indications for caesarean delivery rose out of increased availability of effective antibiotics better anaesthetic techniques, safer blood banking, and a greater tendency for obstetrics to be practiced in facilities delivering large number of patients.

15. For economic reasons (Rao 1992; Cunningham and associates 1993), (The National sentinel Caesarean section Audit Report – Oct. 2001)

INDICATIONS OF CAESAREAN SECTION

In general caesarean delivery is used when labour is contradicted or vaginal delivery is unlikely to be accomplished safely or within a time frame necessary to prevent the development of fetal and / or maternal morbidity in excess of that expected following vaginal delivery.

ACCORDING TO THE TYPE OF OPERATION

a. Classical or upper uterine segment operation

b. Lower segment caesarean section

ACCORDING TO THE TIME OF OPERATION

a. Elective caesarean section

b. Emergency caesarean section.

It is to be noted that almost all indications of elective caesarean section will also be indications of emergency caesarean section if patient reports delivery in labour.

ABSOLUTE INDICATIONS

- Previous two caesarean sections
- Vaginal atresia
- Placenta praevia type IV
- Carcinoma of cervix

RELATIVE INDICATIONS

- contracted pelvis and cephalopelvic disproportion is the commonest indication.
- Previous caesarean section associated with other risk factors.
- Fetal distress during first stage of labour.
- Abnormal uterine contractions leading to non-progress of labour.
- Antepartum haemorrhage : due to placenta praevia or abruptio placentae.
- Malpresentations like breech, transverse lie, brow and mentoposterior position of face.
- Bad obstetric history
- Failed surgical / medical induction
- Primi gravida with associated other risk factors
- Uncontrolled diabetes with previous history of fetal wastage
- Pelvic tumours such as cervical / broad ligament fibroid
- Impacted ovarian tumour
- Vaginal herpes
- HIV in mother to prevent mother to child transmission. (It prevents 50-87% transmission – New England Journal of Medicine 340:977, 1999)

CONTRA INDICATIONS

In the absence of maternal interest are

- Dead fetus
- Baby is too premature to survival
- Presence of blood coagulation disorders.

TIMING OF OPERATION

a. **Elective** : When the operation is done at a prearranged time during pregnancy to ensure best surgical conditions. It is done at or beyond 39 weeks to deliver a mature baby.

b. **Emergency** : When operation is performed in emergency due to unforeseen maternal and fetal complications during or before labour.

THE RISKS OF CAESAREAN DELIVERY :

Immediate

- Risks of anaesthesia (Aspiration pneumonia, hypertension)
- Blood loss (Shock)
- Extension of the lower segment incision
- Bowel or bladder injury
- Amniotic fluid or air embolism
- Scalpel damage to the baby 1-2% (Smith 1997)

Post operative risks

- Infection (in abdominal wound, uterus, peritoneal cavity, urinary tract, Intestinal obstruction)
- Bleeding
- Leg vein thrombosis & pulmonary embolism due to immobility
- Neonatal RDS / Wet lung
- Wound complication like haematoma, pus, burst abdomen

Risks in subsequent pregnancy

- Placenta praevia and / or accreta in subsequent pregnancy
- Rupture of a uterine scar in subsequent pregnancy
- Risk for recurrent caesarean section

Remote Risks

- Infertility due to adhesion
- Bowel obstruction

(c) **Patient request :** There seemed to be a debate of caesarean delivery without obvious medical indication that is based mainly on the wishes of the patient. Although this indication is not accepted by many obstetricians it has become a standard practice although it contributes to a very small number of caesarean deliveries (Paterson Brown 1998)

Though caesarean may sound easier than labour, it is a major surgery. For woman, risks include reactions to anaesthesia, bleeding, infection and urinary tract injury; for the newborn, risks include bodily injury and respiratory problems. Over all recovery time is longer than with vaginal child birth. There are other risks that have been identified.

a. Babies born by elective caesarean sections are sent to nurseries three and a half times more often than the babies of women who deliver vaginally. (American Journal of Obstetrics & Gynaecology May 2005)

b. Women who have C-sections are three times as likely to have complications during child birth and eight times more likely to get a hysterectomy done than those who deliver vaginally. (Archives of Gynaecology and Obstetrics June 2005)

c. Women who have caesarean sections are more likely to have complications in subsequent pregnancies than women who deliver vaginally. (American Journal Obstetrics & Gynaecology, July 2005).

d. Women who gave birth by caesarean section took longer to conceive and more likely to have an ectopic pregnancy. (British Journal of Obstetrics & Gynaecology, Aug. 2005)

RISK OF VAGINAL DELIVERY

(a) The increased risk of severe morbidity or mortality of the neonate

(b) The possible damage to the perineal floor (Suliman 1993)

(c) Concern over pain and stress of labour. (Dr. FISK; controversies in Obstetrics/ Gynaecology 1999)

STRATEGIES TO ADDRESS GLOBAL CAESAREAN SECTION RATES

They are categorized as

1. Psychosocial
2. Clinical
3. Structural

1. **Psychosocial :** One to one trained support during labour (Level-I, evidence)

2. **Clinical :** a) External cephalic version, b) vaginal birth after caesarean section

(Cochrane Database of systematic reviews)

The effective implementation of the proceeding strategies to reduce caesarean rates may depend on the social and cultural milieu and an associated beliefs and practices (BIRTH 29:1 March 2002)

VBAC – Some women who have delivered previously by caesarean section prefer to have their next child vaginally some want to avoid repeating the trauma of major surgery or the extended recovery time associated with c-section.

It has several advantages over repeat caesarean section. Shorter hospital stay, more rapid maternal recovery and lower medical costs. It goes a long way in reducing repeat section rate. (Journal of Obstetrics Gynaecology Feb. 2005; 27(2); (164-88)

3. **Structural :**

Mandatory second option - A cluster randomized controlled trial in Latin America showed that this policy could prevent 22 intra partum caesarean sections per 1000 deliveries (Lancet, June 2004).

COMMONLY REPORTED INDICATIONS FOR CAESAREAN DELIVERY

Indications	Selective	Subjective	Controversial	Universally Accepted
Fetal				
Nonreassuring FHR	✓	✓		✓
Breech, frank	✓		✓	
Breech, nonfrank	✓		✓	
Breech, preterm	✓		✓	
Very low birth weigth (<1, 500g)	✓		✓	
Herpes simplex virus	✓			
Immune thrombocytopenic	✓			

purpua				
Congenital anomalies major	✓		✓	
Maternal – fetal				✓
Cephalopelvic disproportion (relative)	✓	✓		✓
Cephalopelvic disproportion (absolute)		✓		✓
Failure to progress	✓	✓		✓
Placental abruptio	✓	✓		✓
Placenta previa				✓
Maternal				
Obstructive benign and malgnant tumors	✓	✓		✓
Large vulvar condyloma	✓	✓		
Cervical cerclage (abdominal)	✓			
Prior Vaginal colporrhaphy conjoined twins	✓			

Common Indications for caesarean section

Indications	Incidence %
Previous caesarean	36%
Dystocia / CPD	30%
Malpresentation	11%
Fetal distress	9.8%
Others	13.6%

(Data from Motzon et al)

1. **<u>Repeat Caesarean Sections :</u>**

Repeat caesarean sections constitute the commonest indication for caesarean section. There is wide variation internationally in the proportion of women delivered by repeat caesarean section. Approximately 25% of all caesarean deliveries were for the indication of prior caesarean birth in 1970. The percentage of all caesarean procedures attributable to this indication peaked at 37.2% in 1997 (Curtin SC, park MMUS 1989 - 1997)

There is a steep fall in the rate of VBAC with subsequent rising rates of repeat caesarean section. (BIRTH March 2006)

2. **Fetal Distress :**

Introduction of uninterrupted fetal heart rate monitoring in labour has resulted in an increase in caesarean section rates due to fetal distress. However there is consensus that continuous electronic fetal monitoring does not reduce the risk of new born morbidity related to metabolic acidosis or cerebral palsy more than intermittent auscultation. (British Medical Journal, June 2001)

3. **Failure to progress in labour / cephalopelvic disproportion**

Failure to progress in labour due to CPD and persistent occipito- posterior is a common indication for caesarean section. The diagnostic criteria for dystocia have been liberalized and forceps delivery have fallen into relative disfavour.

In the U.S. the forceps delivery rate decreased. In the U.K. the rates of instrumental vaginal delivery range between 10 and 15%. In 1980 to 2000 the rate has declined by half. (British Medical Journal,
May 2004)

4. **Breech Presentation**

Several reasons have been put forward to perform elective caesarean section in the majority of cases of breech presentation. Intra uterine hypoxia and the resulting fetal acidosis is a major risk. The other major fetal complication is traumatic birth injury. Finally, entrapment of the after coming head by the insufficiently dilated cervix adds to hypoxia and trauma in the very vulnerable very low birth weight babies. (Breech Birth 2003) (Normal And Problem Pregnancies 4 edn. Churchill Livingston 2002)

Hammanth trial (1993) published a large prospective randomized trial comparing planned caesarean delivery with planned vaginal birth for term frank

or complete breech presentations. Perinatal mortality neonatal morbidity and serious neonatal mortality were all significantly lower in planned caesarean group (Lancet 2000) (Cochrane Review 2002)

5. **Caesarean section for preterm babies**

The effect of caesarean section on outcome in high and low risk very preterm infant showed that caesarean section was associated with a highly significantly improved survival rate in high risk group, but was not associated with better outcomes in low risk group. (Archives of O & G, 1989) To enhance the chances of survival, with no long term handicap, more and more caesarean sections are performed.

There is little evidence that use of caesarean section for the delivery of very low birth weight infants, independent of maternal or fetal compromise, improves overall survival. It is unable to justify the sharp increase in the use of caesarean sections for these small infants. (JAMA 1989, Cochrane review 2002)

6. **Antepartum Hamorhage**

In placenta praevia, abdominal delivery is the route of choice in over 90% cases. This has no doubt remarkably reduced maternal deaths to less than 1% and perinatal mortality to below 30%. In accidental haemorrhage, caesarean rates are almost 45% to reduce maternal complications and to improve fetal salvage (Bhatt, 1989) (Walvekar 1998)

7. **Pregnancy induced Hypertension**

In severe cases of PIH and eclampsia, caesarean section is resorted to in 10-20% of cases when there is no response to conservative therapy.

8. **Failed Induction of Labour**

Induction of labour is indicated in case of prolonged pregnancy, uncontrolled diabetes, uncontrolled PIH, prelabour rupture of membranes. This leads to failed induction of Labour.

9. **Multifetal pregnancy (Twins)**

There is an increased trend for caesarean delivery of multiple fetuses. The most common indication is presentation other than cephalic by one or both fetuses. (AIMS Journal 1994)

MATERNAL MORTALITY FOLLOWING CAESAREAN SECTION :

The safe mother hood initiative has not accomplished as much as expected during its first decade. There is much clarity now about the actions needed to prevent such deaths, especially the central role of emergency obstetric care.

An estimated 585,000 women die each year from pregnancy related causes. For every women who dies approximately 10 others suffer with a life long consequence.

1. <u>Haemorrhage</u>

Obstetric haemorrhage is a leading cause of maternal mortality (Liljestrand 1999). As haemorrhage is difficult to predict and swift to kill, rates for this cause of death are slow to decline even when the overall rate of maternal mortality declines. Reducing deaths from haemorrhage requires relatively sophisticated skills and facilities, as well as ready access to them. Accidental haemorrhage and placenta praevia at the commonest causes of antepartum haemorrhage. Accidental haemorrhage leads to fatal complications live renal failure and coagulation failure. Post partum haemorrhage is a serious life threatening obstetric problem.

2. **Deep vein Thrombosis and pulmonary embolism**

Venous thromboembolism is a leading cause of maternal mortality following caesarean section. The common risk factors are obesity, operative delivery, thrombophilia and a family or previous history of venous thromboembolism. (Gen. Med 2005; 24; 510-7). Women with a prior idiopathic venous thrombosis or positive family history of thrombosis have a high risk (>10%) and warrant active antepartum and post partum heparin prophylaxis.

3. **Anaesthetic complication**

Anaesthetic complications following caesarean section are many. They are difficult airway (1:280), Aspiration of gastric contents (No:1 cause). Local anaesthetic toxicity, high spinal or epidural block (International Journal of Obstetric Anaesthesia 1996; 5: 258-63)

4. **Rupture Uterus**

The factor responsible for rupture is oxytocin induction / augmentation in scarred uterus or obstetrical manipulation in unscarred uterus. Obstructed labour was responsible for rupture in 26.6%. While previous scar was responsible for rupture in as high as 63.3% cases. Maternal mortality was 3.33% and fetal mortality was 78.66%

(Rashmi & Co Workers, 2001).

5. **Obstructed Labour**

Obstructed labour is one of the most common preventable causes of maternal and perinatal morbidity and mortality. Common causes of obstructed labor are cephalopelvic disproportion, malpresentation and malposition. Recognising the causes of obstructed labour is important if the complications are to be prevented. Adequate prevention can be achieved only through a multidisciplinary approach aimed in the short term at identifying high risk cases and in the long term at improving nutrition (Justin C Konje, American Journal of Clinical Nutrition, July 2000).

6. **Preeclampsia / Eclampsia**

They account for more than 50,000 maternal deaths worldwide each year. Besides, there is five fold increase in perinatal mortality rate. Nutritional, environmental and genetic factors play a role in the maternal systemic reaction.

7. Puerperal sepsis

Puerperal sepsis is more prevalent in developing countries due to nosocomial infections, particularly for operative delivery and antibiotics resistance. If continues to preset a significant risk of obstetric morbidity and mortality. The predisposing factors associated with sepsis were anaemia, prolonged labour, frequent vaginal examinations (>5) and premature ruptured membranes.

Women having caesarean sections are four times more likely to die compared with women having vaginal birth. The difference is attributable to the surgery itself and not any complication that might have led to the need for surgery.

The difference in mortality rates between caesarean section and vaginal birth is almost certainly larger than it appears. (Harper MA et al. obstet Gynaecol 2003). High on the list of cause of death associated with caesarean section are thromboembolism and anaesthetic accidents (Woman's Reproductive health initiative 2001).

MATERNAL MORBIDITY FOLLOWING CAESAREAN SECTION

The incidence of major puerperal infection, thromboembolic events, anaesthetic complications and obstetrical surgical wound infection were higher among women undergoing caesarean section as compared to those with vaginal delivery (Obstet Gynaecol Oct. 2005)

1. **Haemorrhage**

It remains a leading cause of maternal morbidity and mortality in the developed and developing countries. Traditionally post partum haemorrhage is treated either by medical or radical surgical method. In the last decade conservative surgical procedures have been successfully

used in various circumstances. (International Journal of Obstetrics and Gynaecology 2005)

2. **Wound infection :**

The incidence of wound infection after caesarean section is 1-9%.

The most common organism involved are staph.aureus, gram negative organisms and anaerobes. The factors associated with wound infection include size of the hospital, obesity, time in labour, prolonged labour, prolonged rupture of membranes and inexperienced surgeon. Patients with infected wounds spent an extra 2.4 days in hospital (Moir – Bussy BR, Hutton RM, Thompson JR 2000)

Antibiotic prophylaxis of caesarean section results in reduction in incidence of episodes of fever, wound infection, endometritis, urinary tract infections and serious infections after section. Hence justifies the policy of recommending prophylactic antibiotics to women undergoing elective or non-elective caesarean section (Smaill F, Hofmeyr GJ,

Cochrane review 2002)

3. **Urinary tract infection**

Urinary tract infection is a risk of caesarean section as most women are cathetorized. Urinary tract infections rank second to endometritis as a cause `of post caesarean febrile morbidity. The reported incidence varies from as low as 2% to as high as 16% (Schwartz MA, et al, 1999)

4. **Respiratory tract infection**

Post operative chest infection occurs in upto 10% of patients following abdominal surgery. There are no figures for the risk of infection following caesarean section. Predisposing factors include obesity, smoking and preexisting upper respiratory tract infection. (Ghassan Hamadeh, Cindy Dedmon, Paul D, Mozley 1995)

5. **Endometritis**

Post partum fever occurs in 29-95% of caesarean deliveries. The rate of endoetritis is at least 10 times higher in patients who have caesarean delivery, compared to a vaginal delivery. (Ghassan Hamadeh, Cindy Dedmon, Paul D, Mozley 1995)

6. **Urinary tract injuries**

Although uncommon, bladder injury during caesarean delivery can be associated with short term and long term morbidity. Potential complications may include prolonged operative time. Urinary tract infections, prolonged indwelling catheter time and formation of vesicouterine or vesicovaginal fistula. The incidence of bladder injury with caesarean delivery is 0.4% - 0.94% (Nielsen and Hokegard 2005, level of evidence II-2) They found most complications occurred during emergency caesarean delivery and that, during emergency caesarean delivery main factors associated were, station of

the presenting part before surgery, labour before surgery, low gestational age (<32 wks), rupture of membranes before surgery, prior caesarean delivery and skill of operator.

7. **Bowel Injury**

Bowel injury is rare at caesarean section, but may occur particularly during a repeat procedure, or if adhesions from previous surgery are present. Bowel injury may not be easy to recognise post operatively as signs of peritonism are difficult to detect in puerperium as young women can tolerate peritonitis until it is well advanced (James O Drife 2002).

REDUCING MATERNAL MORBIDITY AND MORTALITY FOLLOWING CAESAREAN SECTION

The two important risks in caesarean section causing maternal morbidity and mortality are

1. Infection

2. Theomboembolic disease

This can be reduced by

1. **Antibiotic Prophylaxis**

Women taking antibiotics first before, during or after their caesarean section operation, are much less likely to have post operative infection of their uterus and wound (Smaill F, Hofmeyr GJ, Cochrane review, 2006, Issue 3) A reduction of endometritis by two thirds to three quarters and a decrease in wound infections justifies a policy of recommending prophylactic antibiotics to women undergoing elective or non-elective caesarean section.

2. **Thromboprophylaxis**

Thromboembolism is a major cause of maternal mortality. Pregnancy is a risk factor for venous thromboembolism and seems to increase the risk tenfold in comparison to non-pregnant women. (RCOG guidelines 2004). The risk is higher if delivery is by caesarean section, especially emergency caesarean section. The RCOG proposed a risk assessment profile for thrombosis and that prophylaxis should be based on that assessment. A Thromboprophylaxis strategy, using low molecular weight heparin should be part of the management of all post caesarean section women based on their risk. (Cochrane review 2002) (conference on Antithrombotic and Thrombolytic Therapy, Sep. 2004)

CAESAREAN SECTION AND PERINATAL MORTALITY

The frequency of still birth and neonatal mortality will depend on the underlying reason for caesarean section and the gestational age of fetus.

It has been claimed that the rising caesarean section rates were aimed at bringing down the perinatal mortality rates, particularly in cases of fetal distress, IUGR, breech presentation and very low birth weight infants. But the reduction in the perinatal mortality has been mainly due to the vastly improved perinatal services, risk screening in pregnancy, careful monitoring in labour and availability of specialized neonatal care (Rao 1992; Cunnigham and associates 1993)

According to a report by Hamid R setayesh (BMJ April 2000) Groom and Brown et al demonstrated a significant negative correlation between rate of caesarean section and perinatal and maternal mortality rate. According to a study done in Nowrosjee Wadia Maternity Hospital during 1957 – 1998, the caesarean section rates increasd from 1.9% to 16% with the most significant rise over the past decade. The perinatal mortality rate showed a reduction from 69/1000 in 1957 to 36/1000 in 1992 and remained steady in the 1990's despite the higher caesarean section rates. No improvement in perinatal mortality was observed beyond a caesarean section rate of 10% but the perinatal mortality rate in caesarean section increased significantly due to a more liberal use of caesarean section in preterm deliveries and those that yielded low birth weight babies. (Journal of Health and Population, Dec. 2001)

CAESAREAN SECTION AND PERINATAL MORBIDITY

Caesarean section is not a guarantee against fetal injury. The fetus may also be wounded during the incision into the uterus. Depressed skill fractures, femur fractures and fractures of other limb bones may be found in new born delivered by caesarean section. (Cunningham and associates 1993)

It is clear that respiratory distress syndrome is indeed seen in term infants and is a considerable source of morbidity. Madar et al (BMJ 2000) showed that mechanical ventilation to treat presumed surfactant deficiency is 120 times more likely to be needed after elective delivery at 37-38 weeks than after delivery at 39-41 weeks.

Aim Of The Study

The aim of the study is to know:

1. The current incidence of the caesarean section.

2. The common indications of caesarean section.

3. Maternal mortality and morbidity following caesarean section

4. Perinatal mortality and morbidity following caesarean section

Materials And Methods

4000 consecutive cases of caesarean section done at Institute of Obstetrics and Gynaecology, Chennai between November 2005 and
June 2006 were followed prospectively till discharge from the Hospital to find out the indications for the operation and the maternal and fetal outcome.

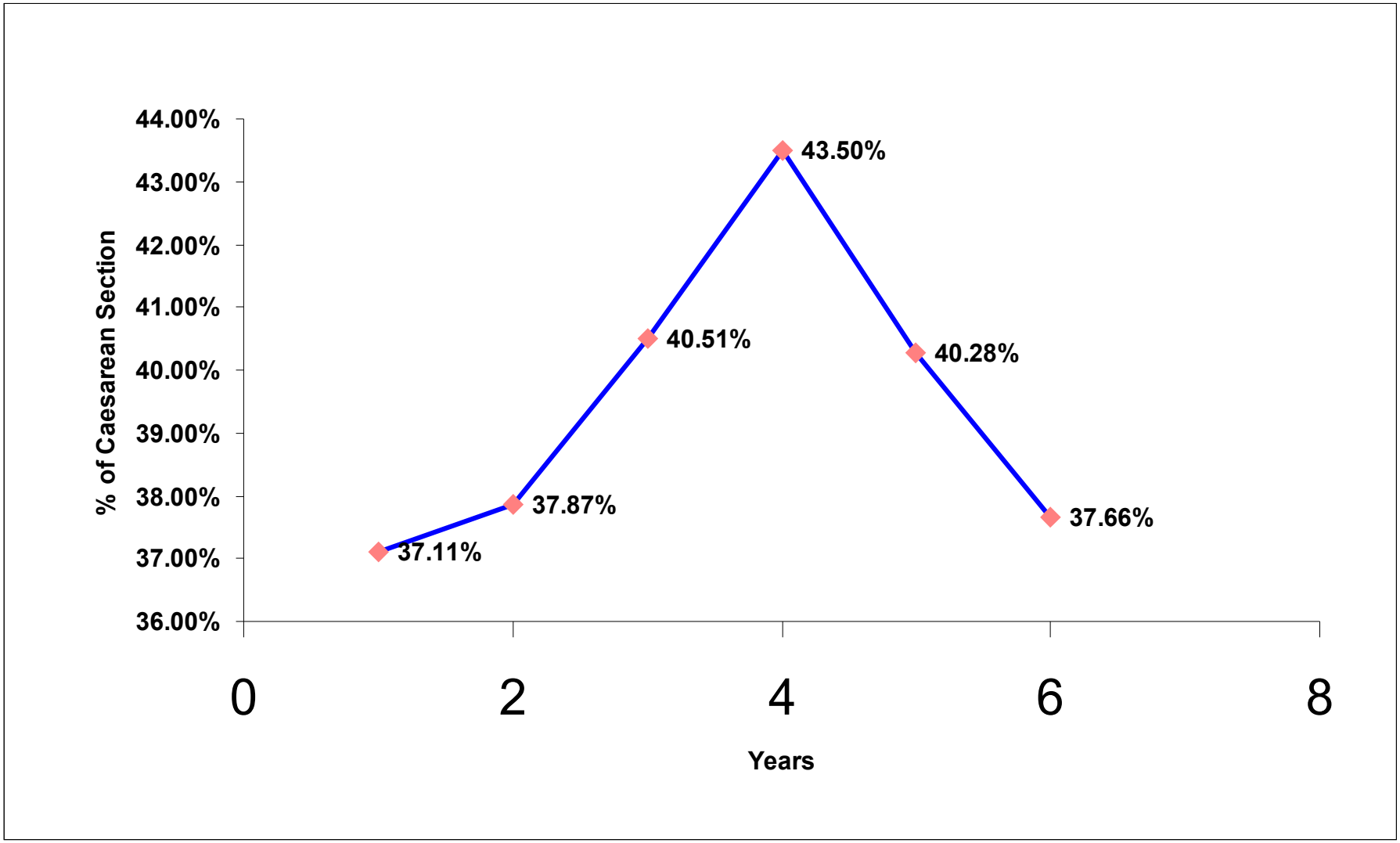
Data relating to caesarean section, Maternal mortality following caesarean section, and over all perinatal mortality during the years 2001-2005 were obtained from the medical records department, Institute of Obstetrics and Gynaecology, Chennai.

Observation

INCIDENCE OF CAESAREAN SECTION IN

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY

	2001	**2002**	**2003**	**2004**	**2005**	**OUR STUDY**
Total Deliveries	19684	19527	18395	17543	16687	10620
Caesarean Sections	7305	7396	7453	7632	6722	4000
Incidence	37.11%	37.87%	40.51%	43.50%	40.28%	37.66%


44.00%
43.00%
42.00%
41.00%
40.00%
39.00%
38.00%
37.00%
36.00%
% of Caesarean Section
43.50%
40.51%
40.28%
37.87%
37.66%
37.11%
0
2
4
6
8
Years

There has been a steady increase in the caesarean rate from 2001 to 2004. There was a fall in the rate in 2005, due to increase in the rate of VBAC.

The slight decrease in the caesarean rate in our study is attributed to the increase in VBAC.

The last five years the total deliveries have come down as all the corporation hospitals, Taluk Head quarters and District Head Quarters Hospital have been equipped with blood bank, anaesthetist & obstetrician. This takes care of the need of local population. Still very moribund cases end up with us.

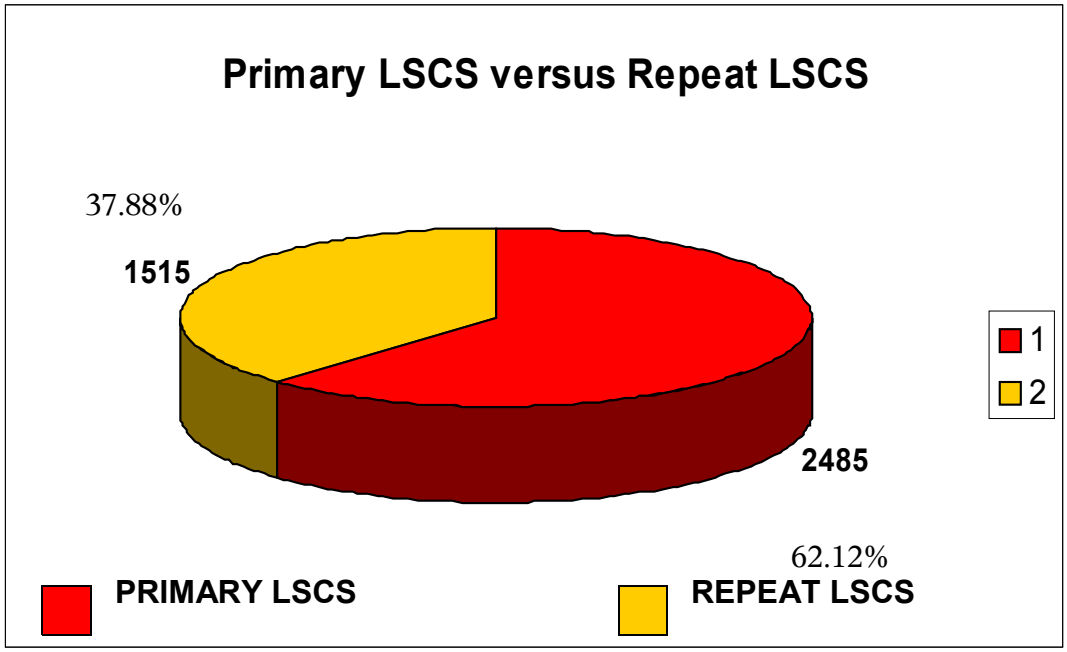
INCIDENCE OF EMERGENCY LSCS VS ELECTIVE LSCS

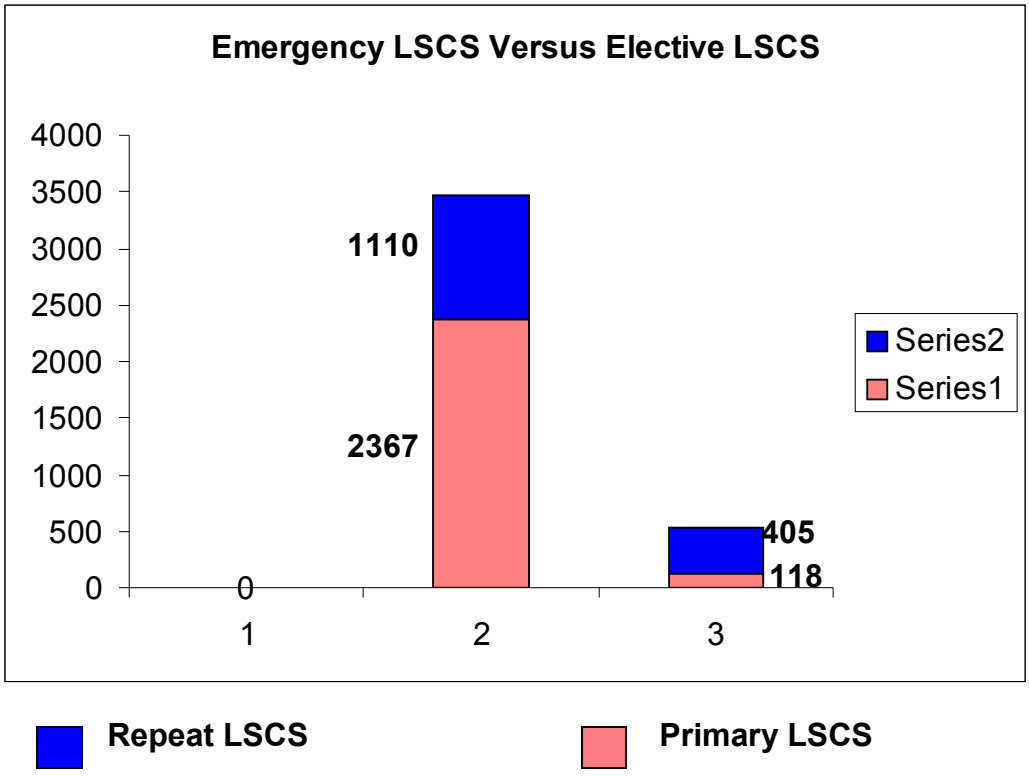
	No.	%
Total No: Deliveries	**10,620**	
No. of LSCS	**4000**	**37.66%**
I) Emergency LSCS	**3477**	**86.92%**
A) Primary section	**2367**	**68.07%**
In primi	**1637**	**69.16%**
In Multi	**730**	**30.84%**
B) Repeat section	**1110**	**31.92%**
II) Elective lscs	**523**	**13.08%**
A) primary section	**118**	**22.52%**
In Primi	**66**	**55.93%**
In multi	**42**	**35.59%**
B)Repeat section	**405**	**77.48%**
Total primary section	**2485**	**62.12%**
Total repeat section	**1515**	**37.88%**

Our primary section rate was 62.12% and very high. However many patients decided for caesarean section else where ended up with us, as ours is a tertiary centre which caters to all the private hospitals, corporation hospitals, Taluk headquarters and District headquarters hospital.

Another reason being institutional delivery is advocated for primigravidas nowadays majority of cases 86.92% were done as emergency sections. 13.08% were

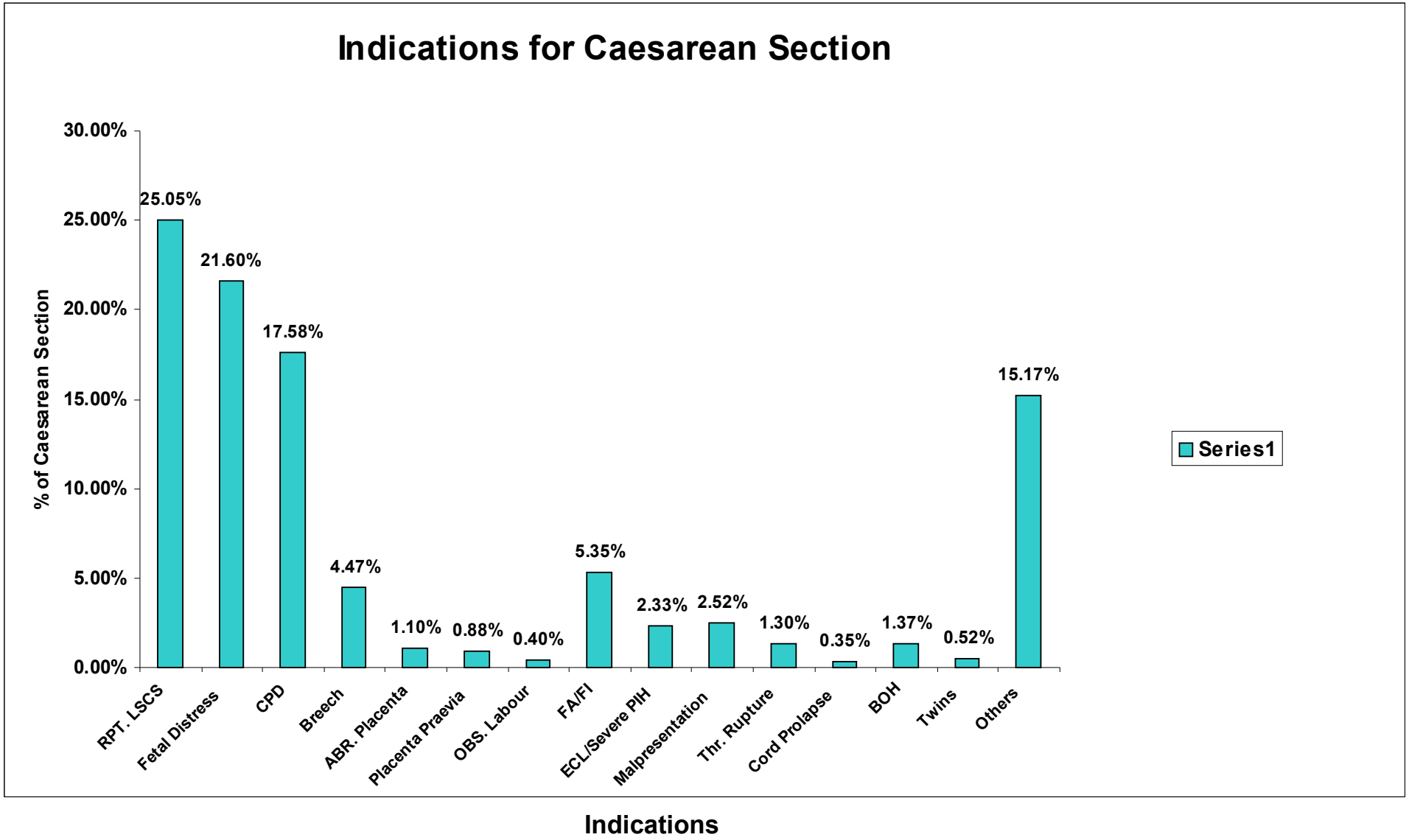
done as elective caesarean sections in our institute.





INDICATIONS FOR CAESAREAN SECTION IN INSTITUTE OF OBSTETRICS AND GYNAECOLOGY - ANALYSIS OF 4000 CASES

S.NO.	INDICATION	NO.	%
	Previous caesarean section as primary indication	1002	25.05%
	Fetal Distress	864	21.6%
	Cephalo-Pelvic disproportion	703	17.58%
	Breech presentation	179	4.47%
	Abruptio placentae	44	1.1%
	Placenta praevia	35	0.88%
	Obstructed labour	16	0.4%
	Failed acceleration and induction	214	5.35%
	Eclampsia / Severe PIH	93	2.33%
	Malpresentation	101	2.52%
	Threatended Rupture	52	1.3%
	Cord Prolapse	14	0.35%
	BOH	55	1.37%
	Twins	21	0.52%
	Others	607	15.17%

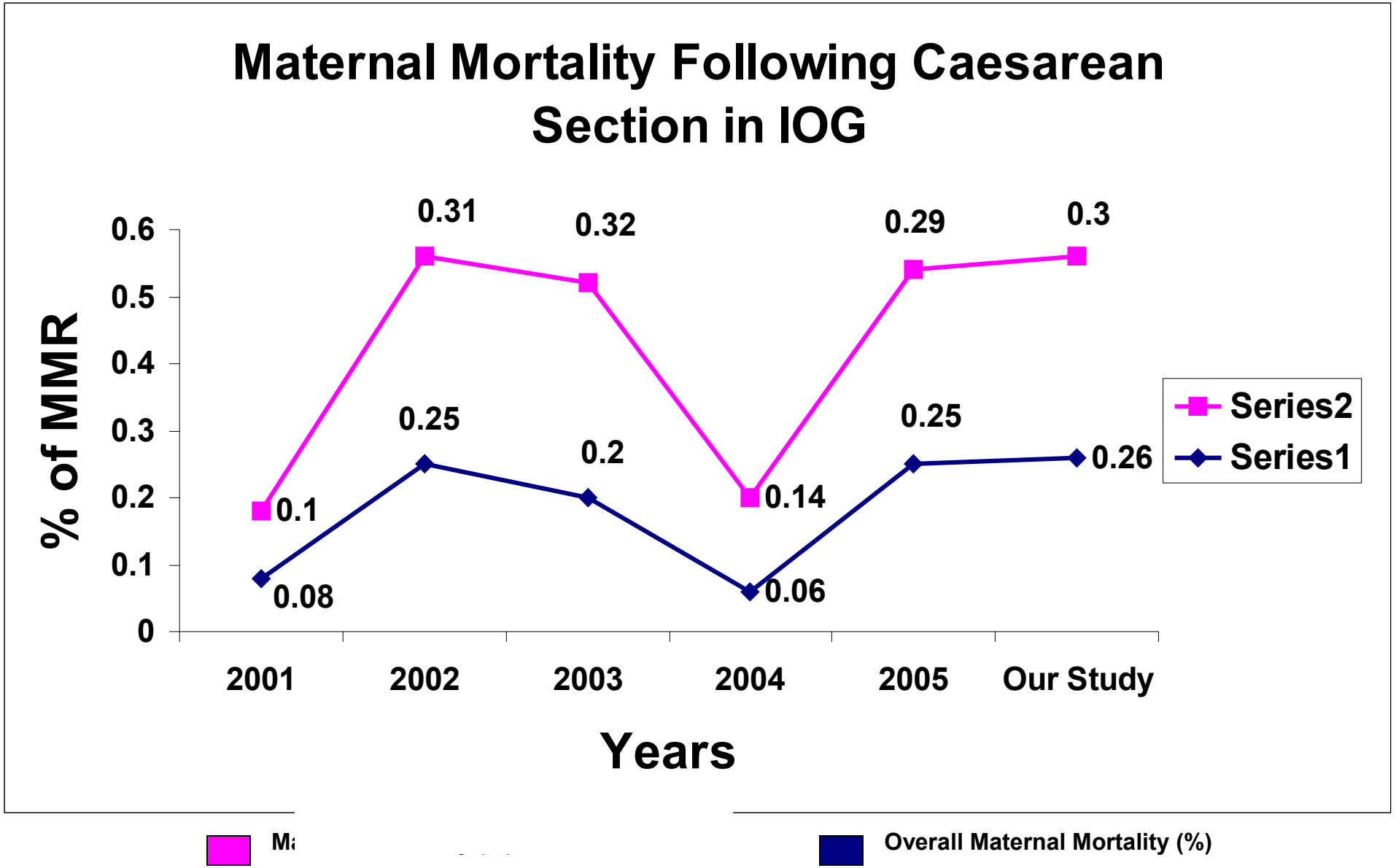

Indications for Caesarean Section
% of Caesarean Section
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
25.05%
21.60%
17.58%
4.47%
1.10%
0.88%
0.40%
5.35%
2.33%
2.52%
1.30%
0.35%
1.37%
0.52%
15.17%
RPT. LSCS
Fetal Distress
CPD
Breech
ABR. Placenta
Placenta Praevia
OBS. Labour
FA/FI
ECL/Severe PIH
Malpresentation
Thr. Rupture
Cord Prolapse
BOH
Twins
Others
Series1
Indications

Repeat caesarean section was the most common indication for which 1002 caesarean sections (25.05%) have been done. Fetal distress was the next common indication for which 864 (21.6%) caesarean section have been done in 17.58%. 4.47% of the Lscs have been done for breech presentation.

Other indications include abruptio placenta, placenta praevia, failed acceleration and induction, eclampsia / severe PIH, malposition, malpresentation, thereatend rupture, cord prolapse, bad obstetric history, multiple pregnancy, oligohydramnios, pre-labour rupture of membranes, gestational diabetes mellitus, and fetal alarm signal.

MATERNAL MORTALITY FOLLOWING CAESAREAN SECTION IN INSTITUTE OF OBSTETRICS AND GYNAECOLOGY

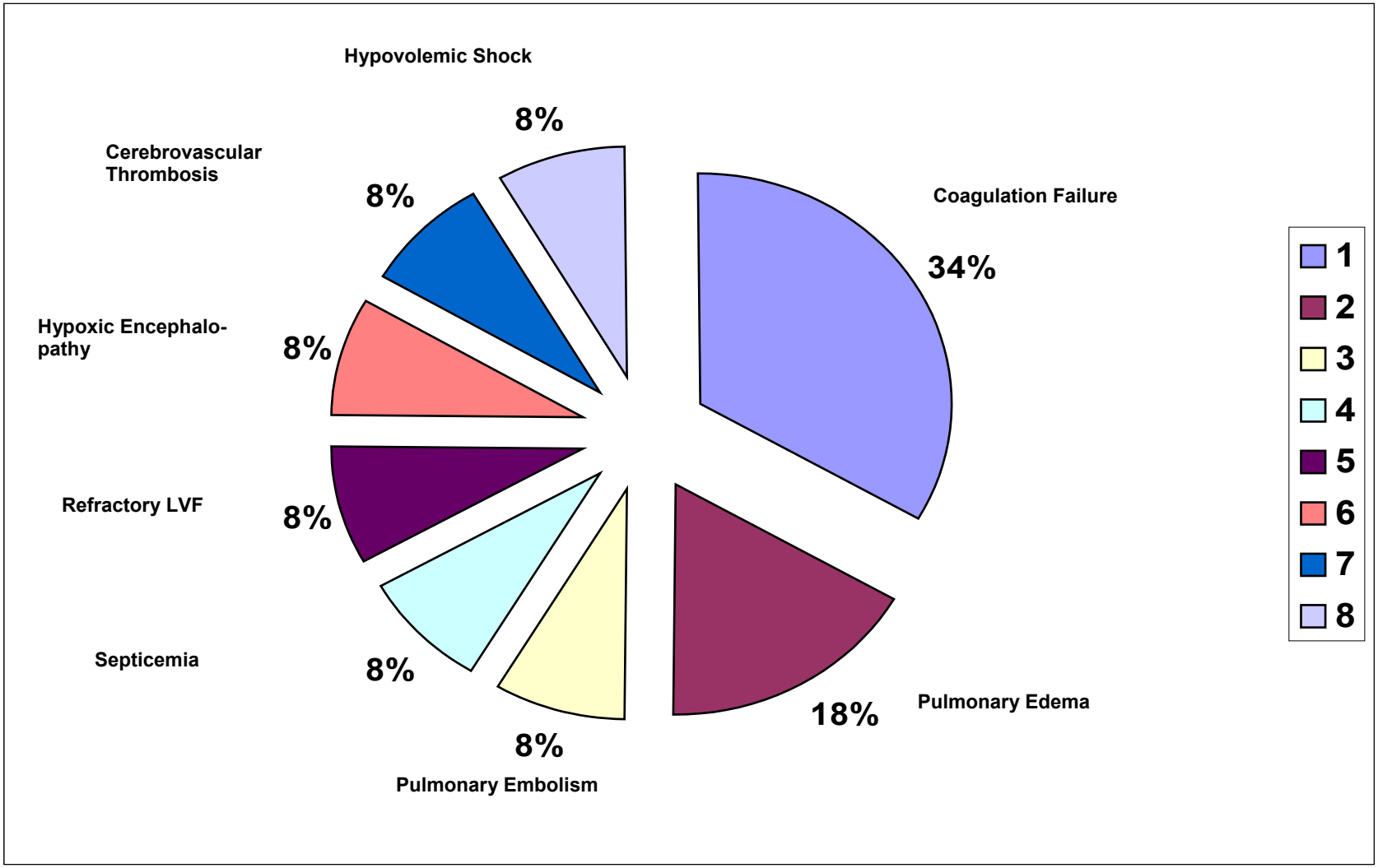
	2001	2002	2003	2004	2005	OUR STUDY
TOTAL CAESAREAN SECTION	7305	7396	7453	7632	6722	4000
OVER ALL MATERNAL MORTALITY %	0.08	0.25	0.2	0.06	0.25	0.26
AFTER LSCS %	0.10	0.31	0.32	0.14	0.29	0.3


Maternal Mortality Following Caesarean Section in IOG
% of MMR
0.6
0.5
0.4
0.3
0.2
0.1
0
0.31
0.32
0.29
0.3
0.1
0.14
0.25
0.2
0.25
0.26
0.08
0.06
2001
2002
2003
2004
2005
Our Study
Years
Series2
Series1
Overall Maternal Mortality (%)

CAUSES OF MATERNAL MORTALITY FOLLOWING CAESAREAN SECTION

Cause of Death	**No**	**%**
Coagulation Failure	4	33.33
Pulmonary Edema	2	16.67
Pulmonary Embolism	1	8.33
Septicemia	1	8.33
Refractory LVF	1	8.33
Hypoxic Encephalopathy	1	8.33
Cerebrovascular Thrombosis	1	8.33
Hypovolemic Shock	1	8.33

CAUSES OF MATERNAL MORTALITY FOLLOWING CAESAREAN SECTION



4 Deaths occurred due to coagulation failure. 1 was following abruption while other 3 were following antepartum eclampsia. 2 deaths occurred due to pulmonary edema, one following antepratum eclampsia and another following uncontrolled PIH, one patient died due to pulmonary embolism on the third post operative day and one patient died due to refractory left ventricular failure following severe uncontrolled PIH.

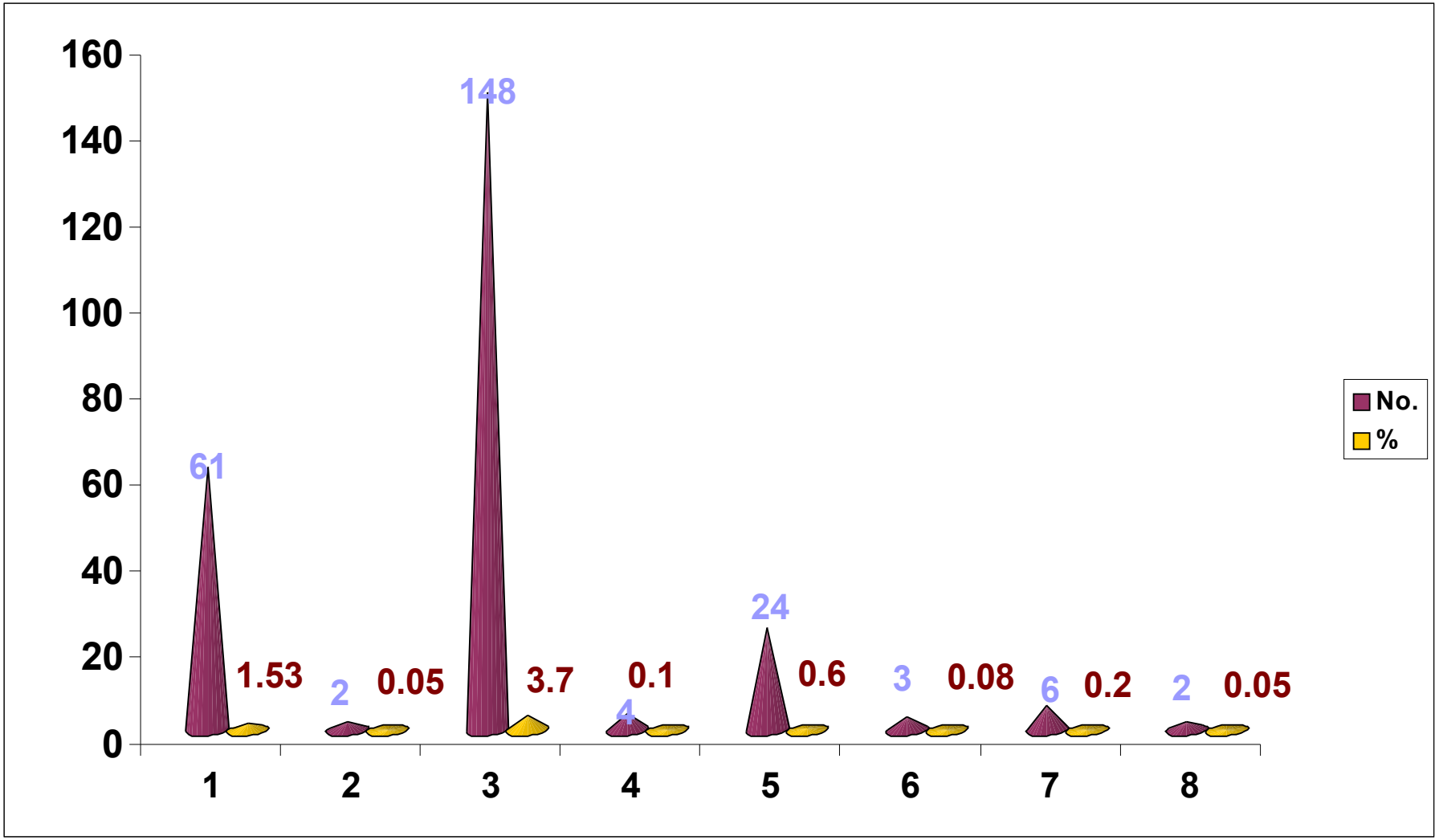
One patient died due septicemia following enteric fever and leptospirosis. One patient died due to hypoxic encephalopathy following severe post partum elampsia. One patient died due to hypovolemic shock following atonic PPH and caesarean hysterectomy. One patient died due to cerebrovascular thrombosis on the sixth post operative day. Out of the twelve maternal deaths following caesarean section, 9 had underlying severe pre-eclampsia / eclampsia attributing to their death. Out of the 12, 9 were primigravidas and 3 were multigravidas. 11 of the patients were unbooked and only one was booked with us. All the 12 patients had undergone emergency caesarean sections.

MATERNAL MORBIDITY FOLLOWING CAESAREAN

SECTION IN 4000 CONSECUTIVE CASES

Complication	No.	%
Wound Resuturing	61	1.53
Burst Abdomen	2	0.05
Hemorrhage (Requiring Transfusion)	148	3.7
Bladder Injury	4	0.1
Paralytic Ileus	24	0.6
Internal Iliac Artery Ligation	3	0.08
Caesarean hysterectomy	6	0.2
Re Laparotomy	2	0.05

Maternal Morbidity following Caesarean Section in 4000 Consecutive Cases



1. Wound Resuturing
2. Burst Adbomen
3. Hemorrhage
4. Bladder Injury
5. Paralytic Ileus
6. IIA Ligation
7. Caesarean hysterectomy
8. Re Laparotomy

Of the 4000 cases, 61 cases (1.5%) went in for wound resuturing, and 2 (0.05%) had burst abdomen for which mass closure was done 148 patients (3.7%) had haemorrhage needing blood transfusion. Each were transfused 1 – 4 Units of blood. In 4 patients (0.1%) bladder injury occurred of which 3 were previous caesarean section and one patient had adhesion due to previous laparotomy and ovarian cystectomy.

Paralytic ileus occurred in 24 patients and all recovered with conservative management 3 (0.08%) patients had internal ilac artery ligation for atonic PPH. All the 3 were primi gravidas. 6 patients (0.2%) under went caesarean hysterectomy for atonic PPH due to failure of conservative management. Out of the 6, 5 were multi gravidas and 1 was a primi gravida. 2 Patients (0.05%) had relaparotomy, 1 due to atonicity and another due to internal haemorrhage. Both were done following emergency caesaeran section. Maternal morbidity rate was 6.25%.

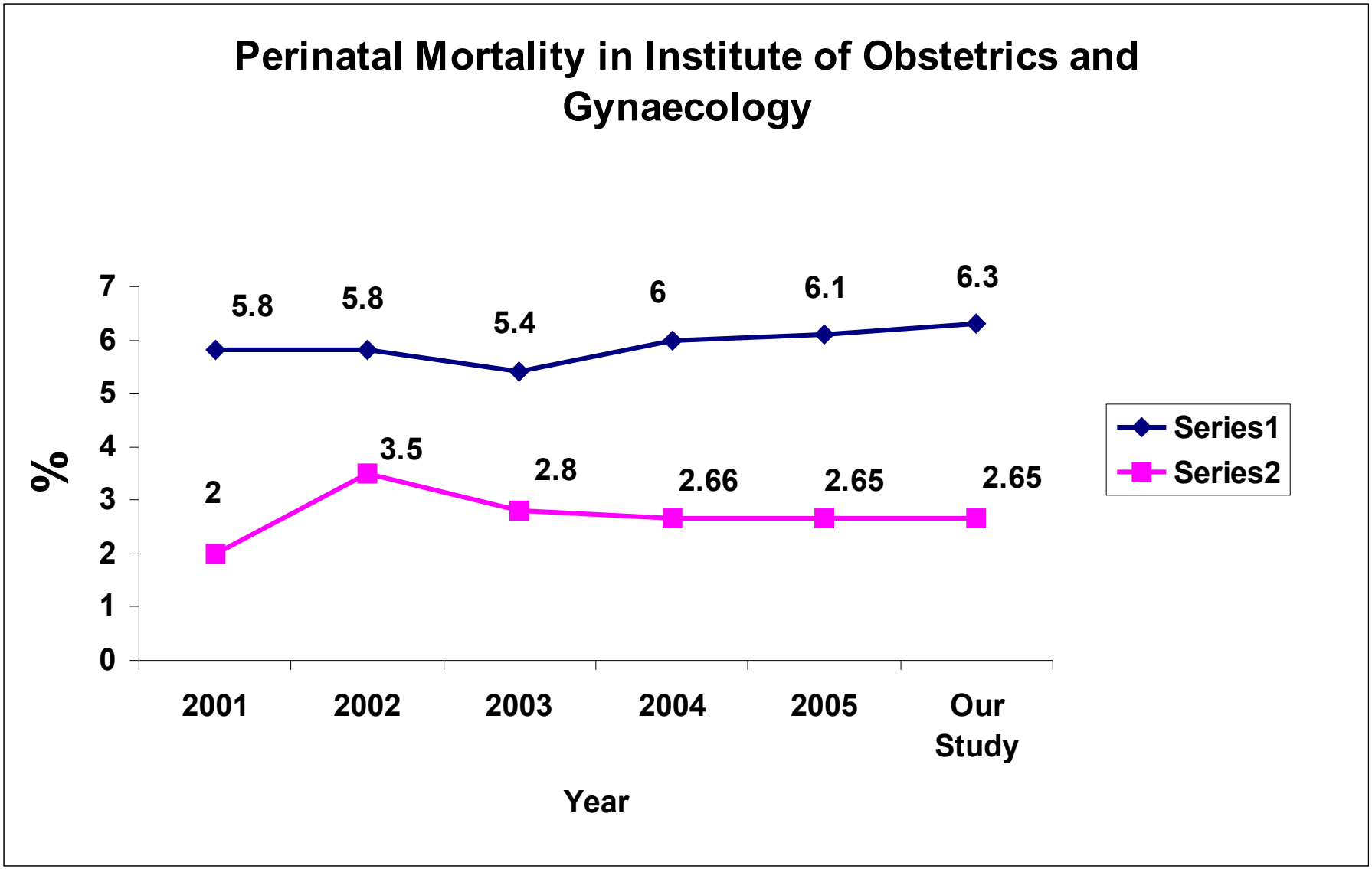
CAUSES OF HAEMORRHAGE REQUIRING BLOOD TRANSFUSION PREOPERATIVELY OR POST OPERATIVELY (N = 148)

CAUSE	NO	%
Operative Complications	32	21.62
Placenta Praevia	35	23.65
Atonic PPH	37	25
Accidental Haemorrhage	44	29.73

PERINATAL MORTALITY IN INSTITUTE OF OBSTETRICS AND GYNECOLOGY

	2001	**2002**	**2003**	**2004**	**2005**	Our study
Overall Perinatal Mortality (%)	5.8	5.8	5.4	6	6.1	6.3
Following LCSC (%)	2.0	3.5	2.8	2.66	2.65	2.65

The overall perinatal mortality rate was 6.3% and perinatal mortality rate following LSCS in our study was 2.65%.


Perinatal Mortality in Institute of Obstetrics and Gynaecology
%
7
6
5
4
3
2
1
0
5.8
5.8
5.4
6
6.1
6.3
2
3.5
2.8
2.66
2.65
2.65
2001
2002
2003
2004
2005
Our Study
Year
Series1
Series2

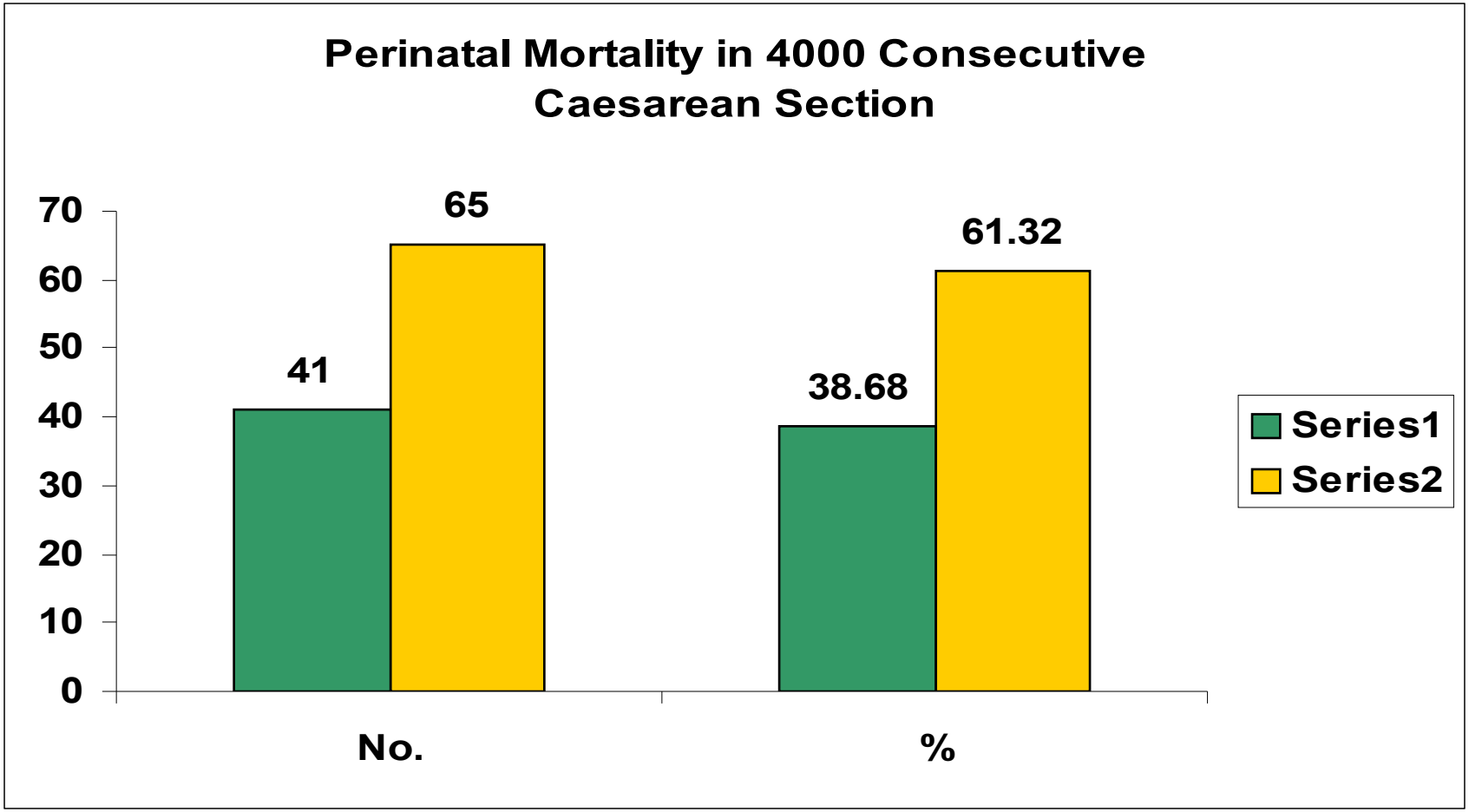
PERINATAL MORTALITY IN 4000

CONSECUTIVE CAESAREAN SECTION

Cause	No	%
Still Birth	41	38.68%
Early Neonatal Death	65	61.32%

Perinatal Mortality Rate – 2.65%

The total perinatal deaths were 106 following LSCS in our study of which 41 were still births and 65 were early neonatal deaths. The perinatal mortality rate was 2.65%.



Still birth

Early Neonatal Death

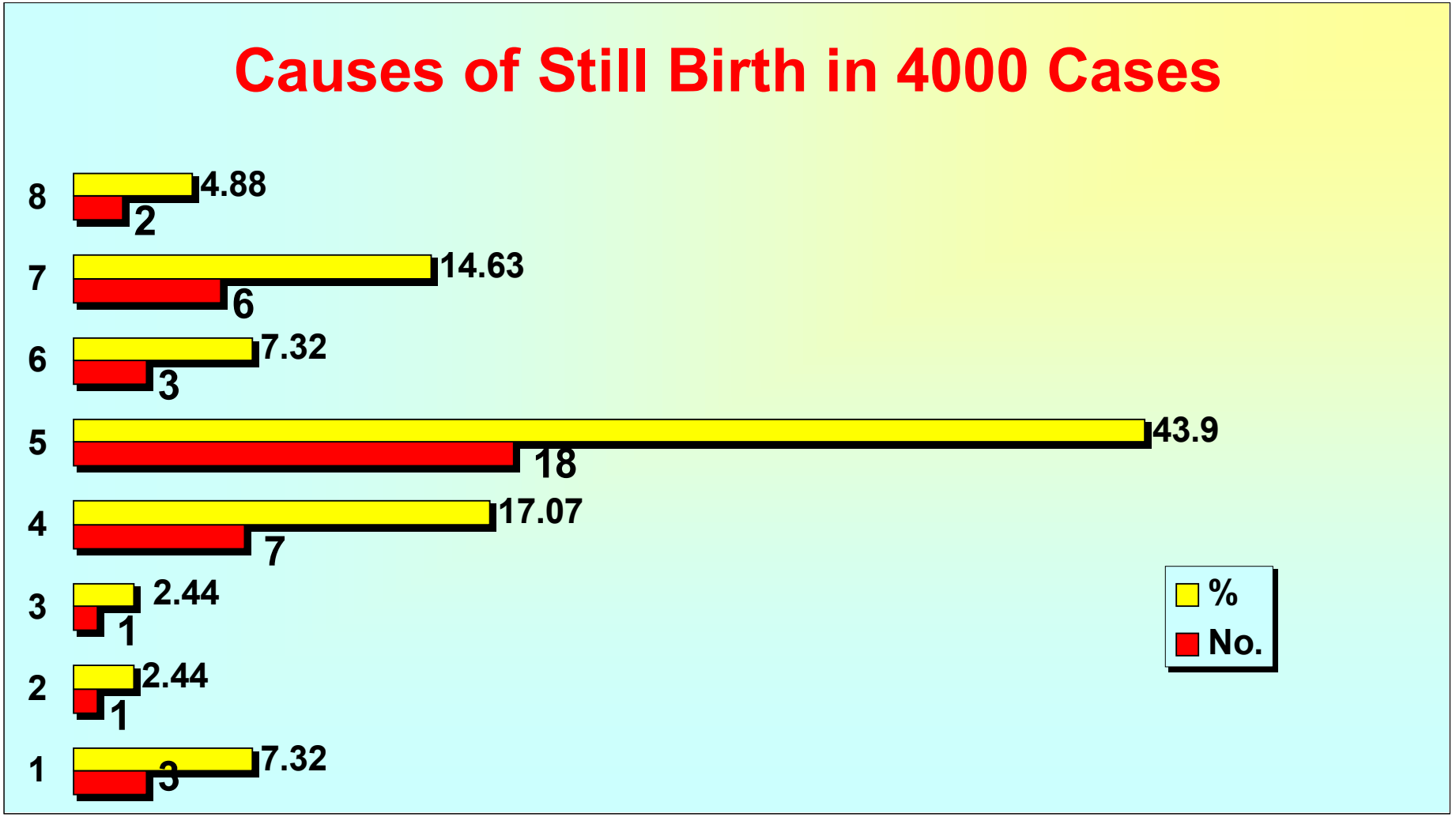
CAUSES OF STILL BIRTH IN 4000

CONSECUTIVE CAESAREAN SECTION (N:41)

CAUSES	NO	%
Rupture Uterus	3	7.32
Breech	1	2.44
Congenital Anomaly	1	2.44
Placenta Praevia	7	17.07
Abruption	18	43.90
One of the Twins	3	7.32
Antepartum Eclampsia	6	14.63
Uncontrolled PIH	2	4.88

All the still birth babies were born in emergency caesarean section. Abruptio placenta contributed majority to the still births followed by placenta praevia and antepartum eclampsia.

Causes of Still Birth in 4000 Cases



1. Rupture Uterus
2. Breech
3. Congenital Anomaly
4. Placenta Praevia
5. Abruption
6. One of the Twins
7. Antepartum Eclampsia
8. Uncontrolled PIH

BIRTH WEIGHT OF STILL BORN BABIES IN 4000 CONSECUTIVE CAESAREAN SECTION (N:41)

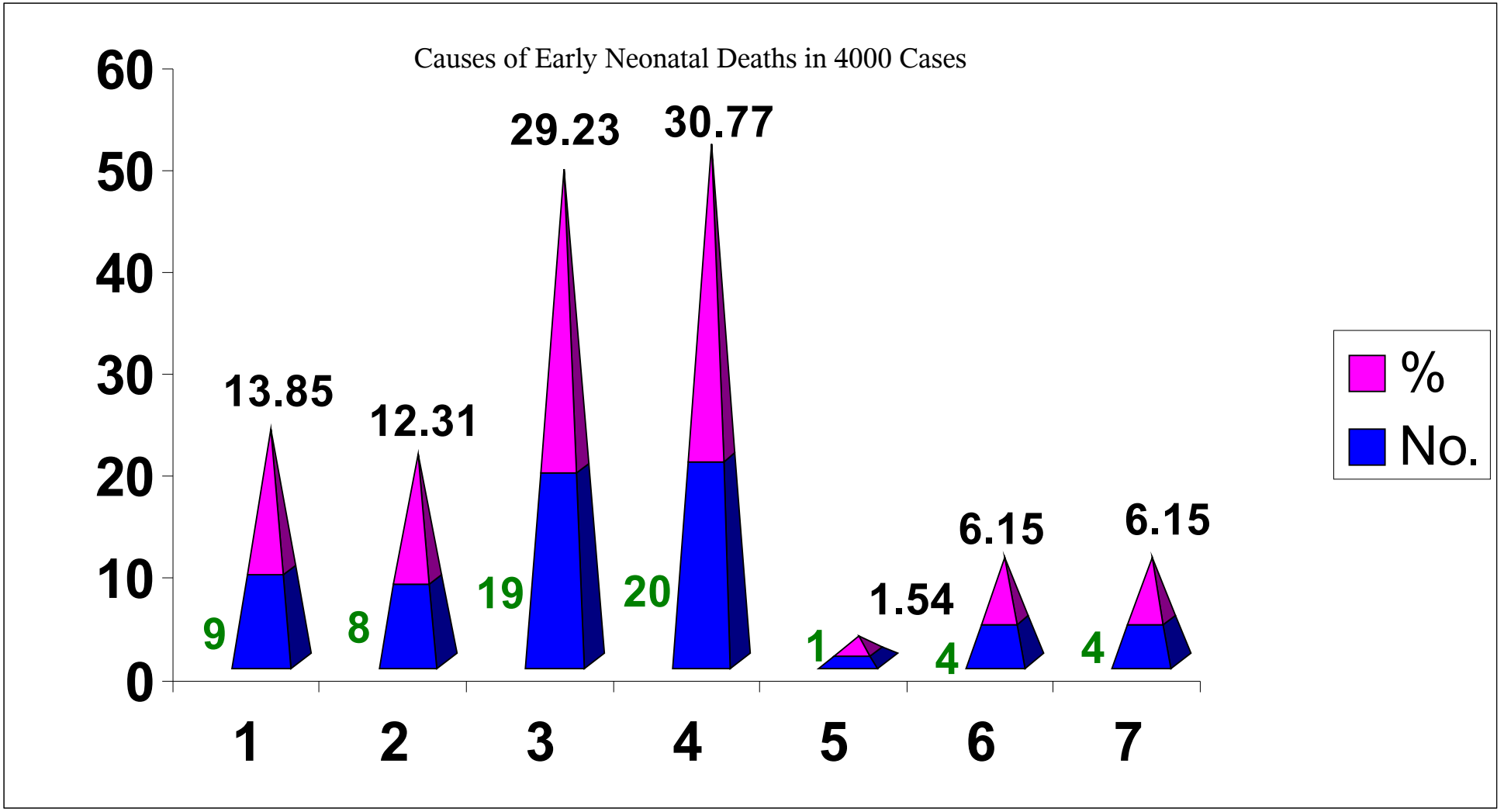
Weight	No	%
> 3KGS	5	12.20
2 – 3 Kgs	15	36.59
< 2 Kgs	21	51.21

Of the 41 still births, 5 babies weighed >3 kgs, 15 babies weighed between 2 to 3 Kgs and 21 babies weighed <2 Kgs.

CAUSES OF EARLY NEONATAL DEATHS IN 4000 CONSECUTIVE CAESAREAN SECTION (N = 65)

CAUSES	No	%
Sepsis	9	13.85
Meconium Aspiration Syndrome	8	12.31
Congenital Anomaly	19	29.23
Birth Asphyxia	20	30.77
Pulmonary Haemorrhage	1	1.54
Preterm	4	6.15
Respiratory distress syndrome	4	6.15

65 Babies had early neonatal death of which birth asphyxia was the commonest cause for 20 (30.77%) deaths followed by lethal congenital anomalies in 19 (29.23%)



1. Sepsis
2. Meconium Aspiration Syndrome
3. Congenital Anomaly
4. Birth Asphyxia
5. Pulmonary Haemorrhage
6. Preterm
7. Respiratory distress syndrome

BIRTH WEIGHT OF EARLY NEONATAL DEATH BABIES (N = 65)

WEIGHT	No	%
> 3 Kgs	10	15.38
2 – 3 Kgs	26	40
< 2 Kgs	29	44.62

Out of the 65, early neonatal death 63 were following emergency lscs and 2 were following elective lscs, both the babies delivered by elective died due to pre maturity which was iatrogenic.

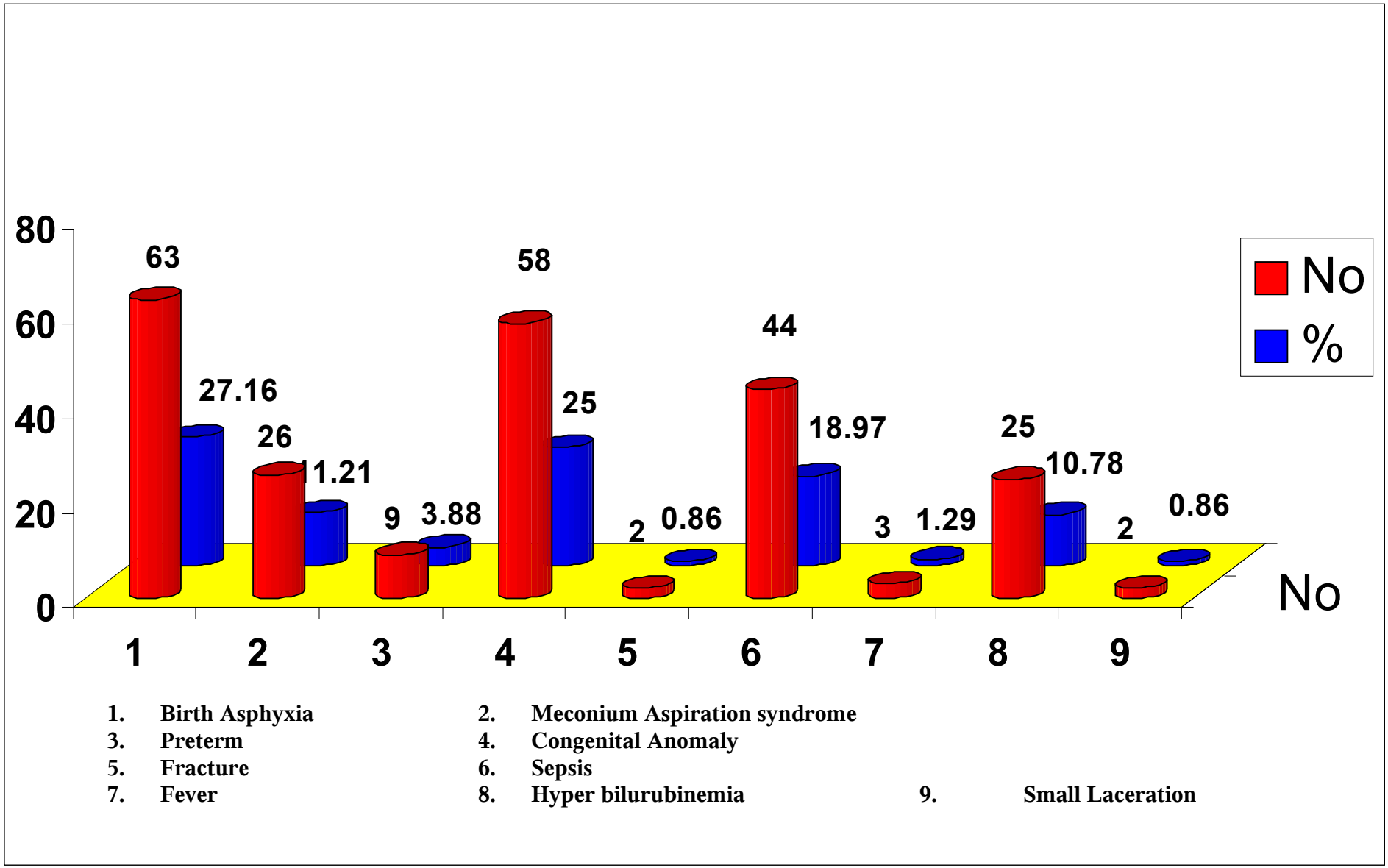
Out of the 65 early neonatal deaths, 10 babies weighed >3 Kgs, 26 babies weighed between 2 to 3 Kgs and 29 babies weighed <2 Kgs.

CAUSE OF PERINATAL MORBIDITY IN 4000 CONSECUTIVE CASES OF CAESAREAN SECTION

(N = 232)

CAUSE	NO	%
Birth Asphyxia	63	27.16
Meconium Aspiration Syndrome	26	11.21
Preterm	9	3.88
Congenital Anomaly	58	25
Fracture	2	0.86
Sepsis	44	18.97
Fever	3	1.29
Hyper bilu rubinemia	25	10.78
Small Laceration	2	0.86

Perinatal Morbidity Rate – 5.8%



1. Birth Asphyxia
2. Meconium Aspiration syndrome
3. Preterm
4. Congenital Anomaly
5. Fracture
6. Sepsis
7. Fever
8. Hyper bilurubinemia
9. Small Laceration

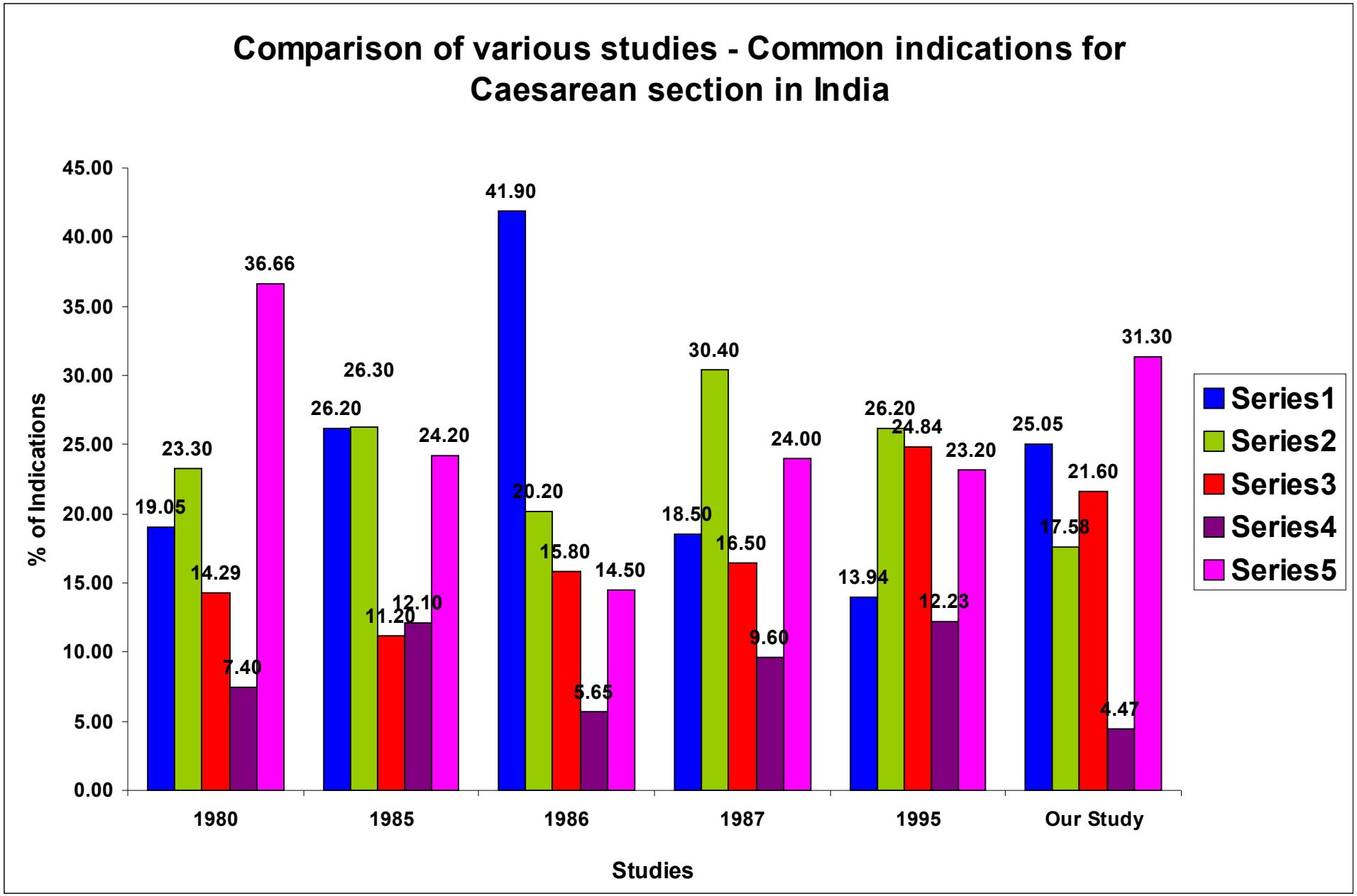
63 babies had birth asphyxia of which 20 died. 26 babies had meconium aspiration syndrome of which 8 died. 4 babies died due to respiratory distress 9 babies were preterm of which 4 died. 58 babies had congenital anomalies of which 19 babies died due to lethal congenital anomalies. 44 babies had sepsis of which 9 babies died. 25 babies had hyperbilurubinemia and there was no mortality in it. 2 babies had fracture of upper arm both were extended breech presentation.

3 babies had fever postnatally and recovered. Two babies had small laceration while putting incision over the lower segment. One was vertex presentation and had a laceration in the scalp 0.5x1mm. The other one was a breech presentation with a small laceration of 1x1mm over the buttock. Both healed well without suturing and without leaving a scar.

Discussion

Caesarean sections are among the most commonly performed surgical procedures, but there have been concerns that they are performed excessively. The factors that influence the decision to perform caesarean sections are complex. Long standing beliefs about appropriate obstetric procedures, concerns about legal consequences and community standards, and the personal wishes of the obstetrician and their patients all enter into the equation.

The performance of a caesarean section is justified only when obstetric risks outweigh the risks of the procedure itself. Given the increasing trend towards institutional deliveries and antenatal measures for early detection of potential obstetric problems, it is expected that the incidence of child birth related problems as well as the need for caesarean section deliveries would decline. However there has been an increasing incidence of caesarean section world wide.


Comparison of various studies - Common indications for Caesarean section in India
% of Indications
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
19.05
23.30
14.29
7.40
36.66
26.20
26.30
11.20
12.10
24.20
41.90
20.20
15.80
5.65
14.50
18.50
30.40
16.50
9.60
24.00
13.94
26.20
24.84
12.23
23.20
25.05
17.58
21.60
4.47
31.30
1980
1985
1986
1987
1995
Our Study
Studies
Series1
Series2
Series3
Series4
Series5

INDICATIONS FOR CAESAREAN SECTION

4000 consecutive caesarean sections have been analysed. Following were the common indication for which it was done

Indications for Caesarean in India

Indications	Deshmukh Mumabi (1980)	Bhaskar Rao Madras (1985)	Arora (1986)	Rawal (1987)	SNDAFTARY Mumbai (1995)	Our Study
Repeat CS	19.05%	26.2%	41.9%	18.5%	13.94%	25.05%
Dystocia/CPD	23.3%	26.3%	20.2%	30.4%	26.2%	17.58%
Fetal Distress	14.29%	11.2%	15.8%	16.5%	24.84%	21.6%
Breech	7.4%	12.1%	5.65%	9.60%	12.23%	4.47%
Others	36.66%	24.2%	14.5%	24%	23.2%	31.30%

1) <u>Repeat Caesarean Section :</u>

This was the common indication in our study. Out of the 4000 cases 1002 cases (25.05%) were repeat sections, in spite of increase in the VBAC rate in our institute. Of the repeat caesarean sections, the majority were performed due to cephalopelvic disproportion or intrapartum fetal distress. Vaginal birth after caesarean section should take into consideration the risk of uterine rupture and risk of perinatal mortality and morbidity.

(2) **Fetal Distress :**

This was the next common indication for which caesarean section was done (21.6%) . The pathogenesis of intrapartum hypoxia, processes such as uteroplacental disease, reduced uterine perfusion, fetal sepsis, reduced fetal reserves and cord compression can be involved alone or in combination, and gestational and antepartum factors can modify the fetal response. (David James et al). In developed countries, continuous electronic fetal monitoring has attributed to increased caesarean rate for fetal distress due to early detection.

(3) **Cephalopelvic disproportion :**

This was the third common indication of caesarean section in our study 17.58%. In our study, patients with gross degree of disproportion were taken up for caesarean section with out a trial of labour. Patients with boderline disproportion were given a trial of labour with continuous intrapartum monitoring. Patients who failed to show progress in labour in spite of good contractions and those who developed fetal distress during labour were subjected to caesarean section.

Misinterpretation of the evolution of labour often leads to unwarranted caesarean section. Lack of progress in cervical dilatation or fetal descent are too readily

interpreted as CPD (Lundy 1983). During active phase, contraction disorders which may be related to quite different reasons are often not treated casually (Friedman 1981) and termination of labour simply because an arbitrary time is set for duration of second stage, too often results in unnecessary caesarean section (Cohen, 1977).

(4) **Breech Presentation :**

According to a study done in a Mumbai Teaching hospital between 2000 – 2001 by Ashok Kumar Shukle showed that breech presentation as an indication for caesarean section has increased from 9 out of 155 in 1981-82 to 30 out of 310 in 2000-2001. In our study 179 out of 4000 caesarean section was done for breech presentation. Flanagan and co-workers (1987) selected 244 women with a variety of Breech presentation for a trial of labour. 45 had cord prolapse and fetal distress and ended up with caesarean section. Apgar scores were generously low for vaginally delivered breech babies. Over all 18% identified for vaginal birth underwent caesarean section.

Cheng and Hannah (1993) found a three to four fold higher perinatal mortality rate and neonatal morbidity due to trauma in planned vaginally delivered infants. The current trend is to employ caesarean section more frequently especially in primipara, as it is the only method by which the obstetrician can avoid the risks of cord compression, cord prolapse, birth trauma and asphyxia. In our study all the term breech were subjected to

caesarean section after ruling out congenital anomalies and confirming the gestational age.

(5) **PIH and Eclampsia :**

In severe cases of PIH and eclampsia, caesarean section is resorted to in 10-20% of cases when there is no response to conservative therapy like antihypertension or $MgSo_4$ therapy (Damania & co-workers 1989). In our study caesarean section has been done in 93 out of 4000 patients with failed induction, failure to progress or fetal distress. Others comprising of Antepartum haemorhage, obstructed labour, failed acceleration & induction, Mal-presentation, threatend rupture, cord prolapse, Bad obstetric history, twins and gestational diabetes mellitus are indications in patients resulting in 31.30% of patients.

MATERNAL MORBIDITY

The rising caesarean section rates in the past two decades indirectly vouches for its safety. Nevertheless it is associated with increased morbidity for the mother and procedure can result in serious complications.

Anticipation is the key to avoidance of complications. Complications are increased in emergency procedures.

(1) Haemorrhage

The average blood loss at caesarean section is about 0.7 – 1.01 litres. However blood loss is usually underestimated particularly when this has been large (> 600 ml)

The commonest cause of hemorrhage is uterine atony and this should be controlled in a systematic way. Massive hemorrhage (>1000ml) reported to occur in 7.3% of caesarean sections. Out of the 4000 cases 148 needed blood transfusion due to hemorrhage. Hemorrhage was either due to operative complication, atonic PPH, placenta praevia or accidental hemorrhage. Hemorrhage accounts for 6% of deaths associated with caesarean section (Creighton and Coworkers, 1991).

(2) Wound infection :-

Wound infection leading on to resuturing and burst abdomen is the next commonest morbidity in our study. A study by Debea K & coworkers, showed an overall 2.8 percent incidence of wound infection in their study (BIRTH 28:4 December 2001). In our study 61 out of 4000 patients (1.53%) went in for resuturing and 2 patients (0.05%) had burst abdomen. The potential risk factors that are unique to caesarean delivery include preexisting intra - amniotic infection, perioperative antibiotic use, duration of ruptured membranes, number of vaginal examinations and elective or emergency reason for the surgery.

(3) Urinary tract injuries :-

Although uncommon, bladder injury during caesarean delivery can be associated with significant short term and long term morbidity. Potential complications may include prolonged operative time, urinary tract infection, prolonged indwelling catheter time, prolonged hospital stay and formation of vesicouterine or vesicovaginal fistula. Nielsen and Hokegard evaluated surgical complications in 1,319 caesarean deliveries. They found that most complications occurred during emergency caesarean deliveries and were associated with station of the presenting part before surgery, labor before surgery, prior caesarean delivery and skill of the operator. The reported incidence of bladder injury is 0.14% - 0.94%.

In our study 4 patients (0.1%) had bladder injury of which 3 were previous caesarean section with extensive adhesions and 1 had adhesions due to previous laparotomy and ovarian cystectomy. All the 4 cases of bladder injury were recognised on table and suturing done. All of them healed well with continuous bladder drainage for 14 days. Ureteric injuries are rare with the reported incidence ranging from 0.02% - 0.05%. In our study there were no ureteric injuries.

(4) **Paralytic Ileus :**

This complication occurred in 24 of our patients contributing to 0.6%. The reported incidence varies from as low as 2% to as high as 16% (Schwartz MA, et al., 1999)

(5) **Internal iliac artery ligation :**

Bilateral ligation of internal iliac arteries is a safe, rapid and very effective method of controlling bleeding from genital tract. It is useful in haemorrhage following gynaec surgeries and to control haemorrhage due to atonic. PPH in obstetrics. (Parthe Mukopadhyay and coworkers, obstet gynaecol India col. 55, No.2, Mar/April 2005). In our study 3 patients had internal iliac artery ligation for atonic PPH and all the 3 were primigravidas. Even when the uterus is preserved, ligation of the arteries do not hamper future reproductive function. Wagaarachchi and Fernando observed future pregnancy in 50% of the cases following bilateral ligation of internal iliac artery.

(6) **Caesarean Hysterectomy :**

The prevalence of hysterectomy due to haemorrhage after caesarean section is 10 times that after vaginal delivery, and the risk of maternal death is increasd upto 16 – fold. (BMJ Aug. 1998). The incidence of caesarean hysterectomy is 0.5%. In our study 6 patients (0.2%) underwent caesarean hysterectomy for atonic PPH due to failure of conservative management.

(7) **Relaparotomy :**

In a study by Kant Anita and coworkers (The Journal of Obstetrics and Gynaecoloy of India, March / April 2005) 3 (7.3%) out of 41 emergency obstetric hysterectomy had under gone relaparotomy due to internal haemorrhage.

We had 2 relaparotomies one was done due to atonic PPH and the other due to internal haemorrhage.

MATERNAL MORTALITY

Out of the 4000 cases there were 12 maternal deaths. Since the safe motherwood initiative began more than a decade ago, there has been a number of important developments in the international women's health field. There are atleast three ways in which maternal mortality is special. First, its magnitude; second, its epidemologic nature; and third, its programmatic requirements. There are more than half a million maternal deaths each year, 99% of which are in developing countries. With 16% of the World's population, India accounts for 20% of the world's maternal deaths. The rate is 5.4/1000 which is very high compared to other countries in Asia.

According to a study in Netherlands done over a period of 10 years (Acta obstet gynaecol 1997 April) The maternal death after a vaginal delivery was 0.04/1000 compared to 0.53/1000 caesarean birth. In our study maternal death after a vaginal delivery was 2.6/1000 compared to 3.0/1000 for caesarean birth. The common cause of death in various studies were pulmonary embolism and anaesthetic complication. Where as in our study the major cause of death was coagulation failure in 4 followed by

pulmonary edema in 2 patients and 1 patient each due to pulmonary embolism, septicemia, refractory left ventricular failure, hypoxic encephalopathy , cerebrovascular thrombosis and hypovolemic shock. Out of the 12 patients, 9 of them had underlying severe preeclampsia or Eclampsia attributing to their death.

PERINATAL MORBIDITY AND MORTALITY

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Caesarean section avoids risks of labour and vaginal delivery including intrapartum deaths, hypoxia and birth trauma. As such it is viewed as the safest mode of delivery for the baby. However successful labor and vaginal delivery confer advantages over babies delivered by caesarean section in terms of respiratory function.

Elective caesarean section is associated with an increased risk of Transient tachypnoea of new born (TTN) and Respiratory Distress syndrome (RDS) when compared to a trial of labour. This risk of respiratory morbidity in babies born by caesarean section is dependent on the gestation, with a significant reduction in the neonatal respiratory morbidity for each advancing week of gestation from 37-40 weeks babies (Morrison et al., 1995, BJOG 2002)

In our study 26 babies had meconium aspiration syndrome of which 8 died and 4 babies died due to respiratory distress syndrome. 63 babies had birth asphyxia of which 20 babies died. 58 babies had congenital anomaly of which 19 died due to lethal congenital anomalies.

Fetal laceration is more likely to occur with an operative than a non-operative delivery. It is probably under reported as most laceration are minor and heal without special treatment and significant scarring or morbidity for the neonate. In our study this

639

58 52
39 1

happened to 2 babies contributing to 0.86%. One was a vertex presentation while the other was a breech presentation.

Smith JF, Fernandaz C & Wax JR in their study on fetal laceration injury at caesarean delivery have found that it is more common with
a breech presentation (6% incidence) than vertex (1.4%) (BJOG 1997; 90:344-346)

25 babies (10.78%) had icterus of which there were no deaths.
44 babies (18.97) had sepsis of which 9 babies died (13.85%). Most of them were born to mothers with prelabour rupture of membrane, membranes ruptured outside or prolonged labour with failure to progress. In our study the perinatal mortality rate was 2.65% and the perinatal morbidity rate was 5.8%.

Summary

1. Consecutive 4000 cases of caesarean section performed between 2005 – 2006 were analysed. The incidence of caesarean section was 37.66% .
2. Maximum patients were in the age group of 21-25 years.
3. Most of the patients were primiparas and second paras. The incidence of caesarean in primi in emergency caesarean section was 69.16% and in elective caesarean section was 55.93%.
4. Repeat section contributed to 37.88% of caesarean section and 62.12% were primary section.
5. The common indications were previous caesarean section as the primary indication 25.05%. Next was fetal distress contributing to 21.6% followed by cephalopelvic disproportion 17.58% and Breech presentation 4.47%.
6. The maternal morbidity was 6.25% and maternal mortality was 0.3% in our study.
7. The perinatal morbidity rate was 5.8% and mortality rate was 2.65% in our study.

Conclusion

The steady rise in caesarean section rates is an area of concern in mother – child health care and a matter of international attention. Monitoring time – trends in caesarean section rates has been considered a useful approach in recognition of this rapidly changing health policy and in estimating the magnitude of this problem.

The incidence of caesarean section has doubled or tripled all over the world in the last 15 years. Justification for this trend is, the lowering of maternal mortality almost to the point of nil and increasing fetal survival as compared to difficult vaginal deliveries. The past decade has noticed an increasing preference to Caesarean deliveries. Historically, as caesarean section rates had crossed the 15% mark that the World Health Organisation had suggested as an upper limit, focus is on determining the extent to which the increase is driven by medical indications. The appropriate use of caesarean section, like the appropriate use of any medical intervention, should be based on risks and benefits.

Caesarean section rates are increasing and most of them hold the media and women responsible for this rising trend. Though the rates have been increasing all over the world and in our country, there was a decrease in the caesarean section rate by 3% in the last year (2005) from 43.50% to 40.28% in our institute. The caesarean section rate in our study was 37.66%. This decrease in the caesarean rate by 2.34% is entirely attributed to the increase in vaginal birth after caesarean section in the last year.

Another reason for decrease in caesarean rate being establishment of 24 hours Comprehensive Emergency Obstetric and New Born Care Services at secondary level

health institutions.

The maternal mortality rate has increased slightly from 0.14% in 2004 to 0.29% in 2005. In our study there has been an increase by 0.01%, this has been attributed to the late referrals received at our institute in moribund condition. Though the Corporation Hospital, Taluk Head Quarters and District, Head Quarters Hospital are provided with comprehensive heath care round the clock and blood bank facilities, moribund patients are referred to us due to ventilator facilities available at our institute. The quality of referral system is crucial for preventing maternal death. The hierarchy of maternity facilities only becomes a functioning unit if the referral system from the lower order health centre to the referral unit is efficient and effective.

The perinatal mortality rate remained the same at 2.65% (post LSCS) despite the decrease in caesarean section rate, where one expects an increase in perinatal mortality rate. There is a **'caesarean birth epidemic'** or rather a **'pandemic'** emerging issue in mother-child health care. The rising caesarean section rates in our state, country and world over deserves international attention.

This also has a bearing on the socioeconomic structure of the individual and the society since immediate and long-term need for absenteeism for work puts an additional burden on the already weak women of low socioeconomic group.

Our observation has also shown that primary caesarean section plays an important role in repeat caesarean sections. Hence judicious decision making for primary caesarean section will go a long way in reducing the caesarean section rate in

future.

Better understanding and training in allowing vaginal birth after caesarean section will also help to reduce the spiraling caesarean section rates. Individualization of every case, meticulous clinical examination, use of intrapartum feto-maternal surveillance along with regular use of partogram would limit the practice of caesarean section. Obstetric audits, following standardized guidelines and practice of evidence based medicine will help us a lot in reducing the rate of caesarean section.

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PROFORMA

Name :

Age :

I.P.No. :

Address :

Booked / unbooked :

Obstetrics Code :

Last Menstrual Period :

Expected Date of Confinement :

Postdated by _____ days

Serial No. :

Date of Admission :

Date of Operation :

Date of Discharge/Death :

Condition at Discharg e

Mother :

Baby :

INDICATION FOR LSCS

CPD

Fetal distress

Prolonged Pregnancy with failed induction

Permanent rupture of membranes

Breech presentation

Eclampsia / Severe PIH

Others

OPERATIVE COMPLICATIONS

Atonic / Traumatic postpartum haemorrhage

Extension of uterine incision

Trauma to the bladder

Anaesthetic complications

Internal Iliac artery Ligation

Caesarean Hysterectomy

POST OPERATIVE COMPLICATIONS

Wound sepsis :
Secondary sutures

Paralytic ileus :

Thrombo embolic manifestations :

Haemorrhage :

Relaparotomy :

Condition at discharge :

Cause of death :

BABY

Liveborn / Still birth :

Sex :

Birth Weight :

Apgar 1 min :

Admission in Neonatology Unit :

RDS

Sepsis

Icterus

Others

Duration of Stay in Neonatology Unit :

Condition at Discharge :

Cause of Stillbirth / Neonatal death :